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Hallicrafters	24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D) Tel. Rec.	300-6
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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 284	
	Admiral models T1801, N, T1802, N, T1806, N and T1807, N (Ch. 17XP3) were covered in Photofact Folder 2 – Set 284. Models TS1801, TS1802, TS1806 and TS1807 (Ch. 17SX3) have the same basic circuitry, except they are VHF-UHF sets using a 41MC IF. A complete comparison of chassis will be made later in this bulletin.
Ch.17XP3 Run 3	The following production changes were made in the 17XP3 chassis in later production. PHYSICAL CHANGE R39 is removed from the printed circuit board and mounted on the main chassis to make the printed circuit board universal for VHF and VHF-UHF sets.
Run 4	NEW VHF TUNER A turrent type VHF tuner (part #94D91-1) is used in Run 4 and higher. A schematic of this tuner (Fig. 1) and alignment procedure are given in this bulletin.
Run 5	TO PREVENT IF REGENERATION A 5000MMF capacitor added from pin 5 of V6 to ground.
Run 6	COMPONENT CHANGE C66 and C67 are changed from the conventional mounting type to the upright mounting type.
Run 7	TO PREVENT DAMAGE TO THE HORIZONTAL OUTPUT TUBE A 4700MMF capacitor is added in series with the horizontal drive trimmer (B2) to protect V14 in case the horizontal drive trimmer becomes shorted.
Run 8	TO INCREASE HORIZONTAL DRIVE R83 is decreased from 100KΩ to 82KΩ .
Run 9	TO PREVENT CAPACITOR FAILURE The voltage rating of C78 is increased from 600 Volts to 1000 volts. In early production, C78 may be two 1MFD, 600V capacitors connected in series.
Ch.17SX3	Chassis 17SX3 is electrically identical to chassis 17XP3, except for the following changes.
	NEW VHF-UHF TUNER AND 41MC IF STRIP A new VHF-UHF tuner (part #94E75-3 or 94E75-13) is incorporated in chassis 17SX3. A schematic showing the new tuner and IF strip (Fig. 2) and alignment procedure are given in this bulletin.

ADMIRAL MODELS T1801, N, T1802, N, T1806, N, T1807, N (Ch. 17XP3), TS1801, TS1802, TS1806, TS1807 (Ch. 17SX3)

PRODUCTION CHANGES
BULLETIN 140

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	COMPONENT CHANGE R39 is increased from 470Ω to 1.5KΩ. 1st. Video IF coil (L11) changed to part #94D64-103. 2nd. Video IF coil (L14) changed to part #72D111-34. 3rd. Video IF coil (L16) changed to part #72D111-35. 4th. Video IF coil (L17) changed to part #72B143-3. Vertical oscillator transformer (T1) changed to part #79B63-3. Deflection yoke (T4) changed to part #94D87-3. R92 is decreased from 47Ω to 39Ω. A 1000MMF capacitor is added from pin 5 of V6 to ground.
Run 1	AGC CIRCUIT A partial schematic is given in Fig. 3 showing the AGC circuit used in chassis stamped Run 1.
Run 2	AGC CIRCUIT REVISED In Run 2 the AGC circuit has been revised and is shown in Fig. 2.
Run 3	TO PREVENT DAMAGE TO THE HORIZONTAL OUTPUT TUBE A 4700MMF capacitor is added in series with the horizontal drive trimmer (B2) to protect V14 in case the horizontal drive trimmer becomes shorted.
Run 4	TO INCREASE HORIZONTAL DRIVE R83 is decreased from 100KΩ to 82KΩ.
Run 5	TO PREVENT CAPACITOR FAILURE The voltage rating of C78 is increased from 600 volts to 1000 volts.

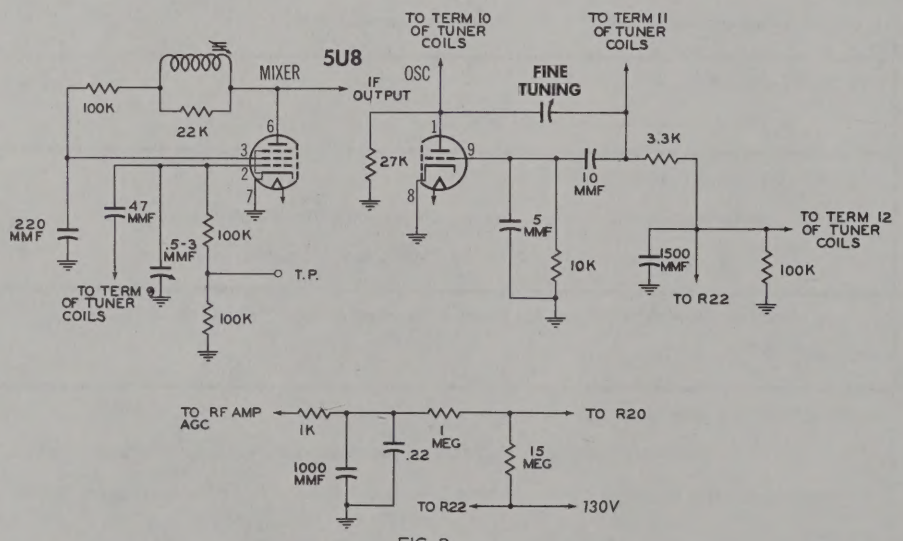

FIG. 3

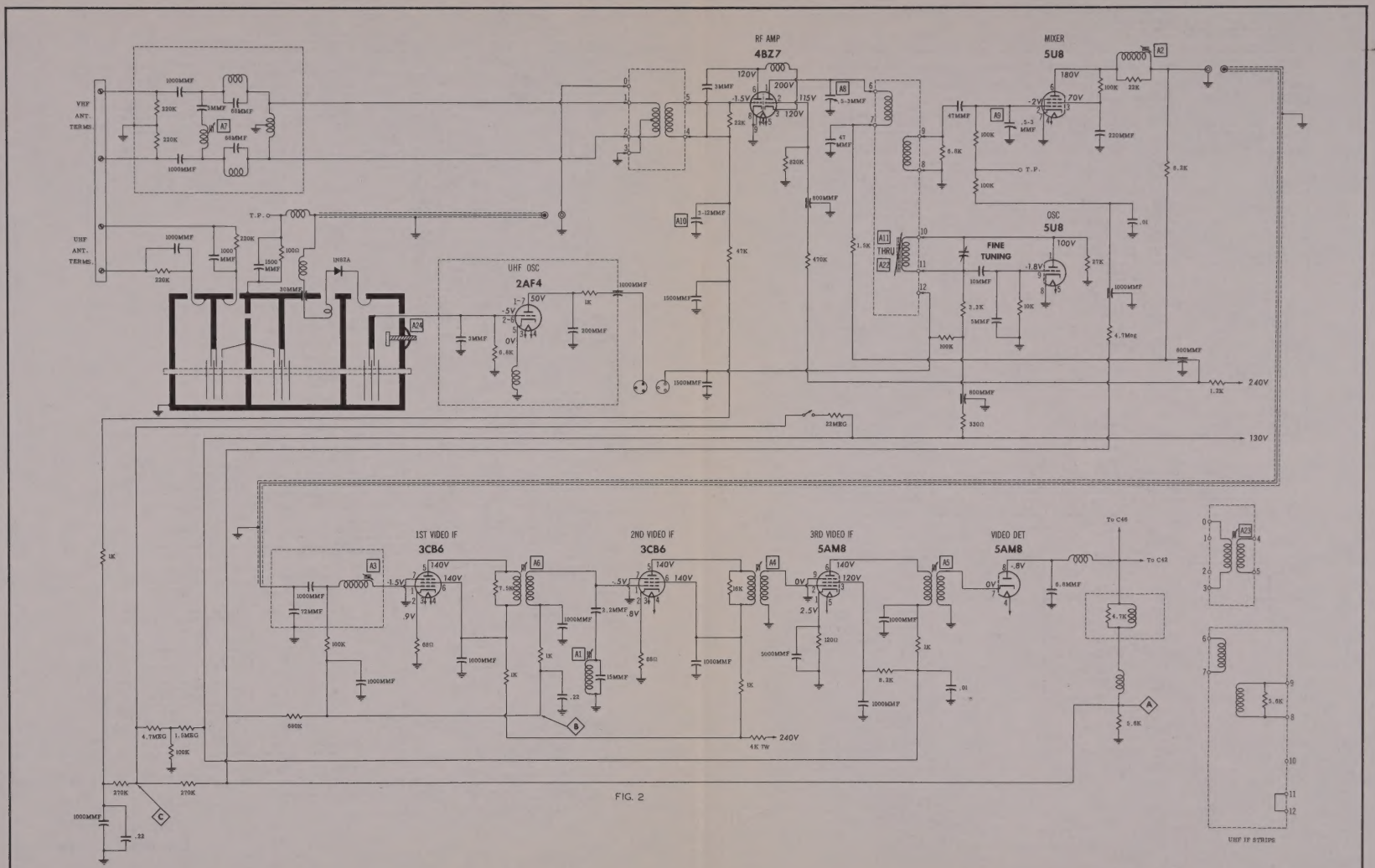
RF AMP
4BZ7
MIXER
5U8
OSC
5U8
FINE TUNING
UHF OSC
2AF4
1ST VIDEO IF
3CB6
2ND VIDEO IF
3CB6
3RD VIDEO IF
5AM8
VIDEO DET
5AM8
VHF ANT. TERMS.
UHF ANT. TERMS.
1N82A
T.P.
240V
130V
To C46
To C42
UHF IF STRIPS

FIG. 2

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
Allow a 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT FOR CHASSIS 17SX3

Connect the negative lead of a 3 volt bias supply thru a 10KΩ to point B . Connect the positive lead to chassis. Short antenna terminals together.
Turn the contrast control to its maximum counter clockwise position. Use only enough sweep generator output to provide usable indication on VTVM (use lowest DC scale).
Signal generator to be used should be checked against a crystal calibrator or other frequency standard for absolute frequency calibration.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (5U8). Low side to chassis.	47.25MC (Unmod)	12 or any unused high band channel	Thru decoupling filter (Fig.1) to point A . Common side of VTVM to chassis.	A1	Preset A2 and A3 fully counter clockwise. Attenuate generator output to maintain not more than 1 volt at VTVM. Adjust A1 for MINIMUM deflection.
2.	"	"	45.3MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	43.5MC	"	"	A3	Adjust for maximum deflection. This is a temporary adjustment. Final adjustment of A3 occurs in step 5.
4.	"	"	43.3MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	45.3MC	"	"	A3	Readjust A3 for maximum deflection at 45.3MC.
6.	"	"	43.3MC	"	"	A5	Adjust for maximum deflection.
7.	"	"	45.3MC	"	"	A6	"
8.	"	Across antenna terminals.	43.5MC	2 or any unused low band channel	"	A7	If necessary, use maximum signal generator output. Adjust A7 for MINIMUM deflection. Repeat steps 1 thru 5.

OVERALL VIDEO IF RESPONSE CHECK FOR CHASSIS 17SX3

Leave bias connected as under "Video IF Alignment". Increase bias to 4.5 volts at point B . If a separate marker generator is used. Couple it loosely to the high side of the sweep generator output lead on tube shield.
Turn contrast control fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over converter tube (5U8). Low side to tuner chassis.	44MC (10MC Swp)	41.25MC 42.0MC 43.95MC 45.75MC 47.25MC	12 or any unused high band channel	Vert. Amp. thru decoupling filter (Fig.1) to point A . Low side of scope to chassis.		Check for response similar to Fig. 2. SLIGHTLY retouch A2 and A3 if unequal peaks occur. If after adjusting A2 and A3 the response is still not similar to Fig. 2, repeat steps 1 thru 9. If suitable response still cannot be obtained after repeating steps 1 thru 9, it may be necessary to check video amplifier tubes or circuit components.
10.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC (Video marker) 209.75MC (Sound marker)	12	"		Check for response curve similar to Fig. 3. If necessary SLIGHTLY retouch A2 and A3 if unequal peaks occur.

VHF RF AND MIXER ALIGNMENT FOR THE VHF-UHF TUNER 94E75-3 OR 94E75-13 USED IN CHASSIS 17SX3

Connect the negative lead of a 3 volts bias supply to point C . Connect the positive lead to chassis. If difficulty is experienced in obtaining a response of sufficient amplitude, remove the bias battery and connect a short jumper from point C to chassis. Sweep and marker generator outputs should be attenuated for minimum outputs that will give usable indications on scope. The marker pips should be just barely visible on response curve. If a separate marker generator is used, couple it loosely to the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point D . Low side to chassis.	A8, A9	Adjust for response curve similar to Fig. 3.
12	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A10	"
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig.3. If markers fall below 70% on any high band channel, make compromise adjustments of A8 and A9 with channel switch set to that channel. Check all other high band channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
14.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for response curve similar to Fig.3. If markers fall below 70% on any low band channel, make compromise adjustment of A10 with channel switch set to that channel. Check all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

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VHF OSCILLATOR ALIGNMENT FOR VHF-UHF TUNER 94E75-3 OR 94E75-13 USED IN CHASSIS 17SX3

Connect bias as under "Video IF Alignment".
The channel oscillator adjustments are reached thru a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each channel.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupling filter (Fig.1) to point A. Low side of scope to chassis.	A11	Adjust to place video marker at 50% on response curve as in Fig. 4. Sound marker should fall at less than 5% on response. It may be necessary to temporarily increase sweep and marker generator for output and scope gain to view the sound marker.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

ALTERNATE VHF OSCILLATOR ALIGNMENT FOR VHF-UHF TUNER 94E75-3 or 94E75-13

Tune in any local TV station. Set the fine tuning control to its mid-range position. Adjust the oscillator channel strip adjustment for clearest picture and best sound. Repeat procedure for all stations available in the area.

IF PRE-AMPLIFIER RESPONSE CURVE ALIGNMENT FOR VHF-UHF TUNER 94E75-3 OR 94E75-13 USED IN CHASSIS 17SX3

Set VHF channel selector switch to UHF position (between channels 2 and 13).
Connect the negative lead of a 3 volt bias supply to point C. Connect the positive lead to chassis.
Disconnect IF input cable from VHF tuner IF output.
Remove 1N82A crystal from its crystal holder. Use only enough sweep and marker generator output to provide usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	100Ω Carbon Resistor	High side thru 100Ω to negative clip (clip end nearest front end of tuner) on crystal holder. Low side to UHF tuner chassis.	43.5MC (10MC Swp)	41.25MC 45.75MC	Between channels 2 and 13	Vert. Amp. thru 10KΩ to point D. Low side to chassis.	A23	Check for response curve similar to Fig. 5. If necessary, adjust A23 for maximum amplitude near center of response curve with correct bandwidth and marker positions. If necessary, make compromise adjustment of A23.
17.	"	"	"	"	"	Vert. Amp. thru decoupling filter (Fig.1) to point A. Low side to chassis.		Increase bias at point C to -6 volts. Reconnect IF input cable to VHF tuner IF output. Check for response curve similar to Fig. 4. If necessary, repeat step 16. Replace 1N82A crystal in its holder.

UHF TUNER ALIGNMENT FOR VHF-UHF TUNER USED IN CHASSIS 17SX3

The UHF portion of this tuner has been properly aligned at the factory and is very stable. Alignment of this portion of the tuner should seldom be required.
Alignment should not be attempted unless the proper test equipment is available.
If a separate UHF marker generator is used, couple it loosely to the transmission line between the antenna terminals and UHF tuner.
Connect the negative lead of a 1.5 volt battery to point C. Connect the positive lead to chassis.
Connect VHF marker generator to an ungrounded tube shield floating over the RF tube (4BZ7). Low side of generator to tuner chassis.
The VHF marker generator is used to make certain that the proper band of frequencies is being selected by the UHF IF preamplifier and UHF tuner.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	887.0MC (12MC Swp)	887.5MC	83	Vert. Amp. thru 10KΩ to point D. Low side to chassis.	A24	Adjust A24 to place 887.5MC marker in center of response curve (Fig. 6).
19.	"	"	473.0MC (12MC Swp)	473.5MC	14	"		Check for location of 473.5MC marker on response curve, if necessary knife the segment of the oscillator rotor blade until marker is centered on response curve.
20.	"	"	887.0MC (12MC Swp)	887.5MC	83	"		Adjustment is made from bottom of tuner. Adjust both UHF pre-selector trimmer tabs by moving tabs up or down until a maximum amplitude response with correct shape of response curve is obtained as in Fig. 6.

21. Check for response similar to Fig. 6 by switching sweep generator and tuner thru all UHF channels (from 83) down thru channel 14. Where necessary, bend preselector rotor blade segments to obtain proper response. Always bend the plates while tuning lower in frequency to avoid disturbing the tracking of the sections previously adjusted. A check of the section requiring bending may be made by touching the slotted plates with the bending or knifing tool while observing response on scope. Bend one or both sections if necessary to obtain proper response for that particular channel. Care should be used while bending the slotted rotor plates so as not to disturb the position of the stator line.

UHF OSCILLATOR ALIGNMENT USING ON THE AIR SIGNAL

In the event the UHF oscillator tube has been replaced it may be necessary to adjust the UHF oscillator adjustment (A24).
It is recommended that several tubes be tried and the one which works best should be used.
After replacing oscillator tube tune in a UHF TV signal and adjust A24 for best picture and clearest sound.
With A24 set for best picture, it may not be at the point at which the sound is loudest. Check all other UHF stations operating in that area. If necessary make compromise adjustment of A24.

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
Allow a 15 minute warm-up period for receiver and test equipment.

VHF OSCILLATOR ALIGNMENT FOR TUNER 94D91-1

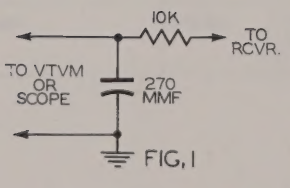
The correct oscillator adjustment screws are reached thru a hole just above the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the negative lead of a 3 volt battery thru 10KΩ to the IF AGC line.
Connect the positive lead to chassis.
Connect a 330MMF capacitor across scope input terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to high side of detector load resistor. Low side to chassis.	A10	Adjust to place sound marker in trap as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A11	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A12	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A13	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A14	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A15	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A16	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A17	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A18	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A19	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A20	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A21	

VHF RF AND MIXER ALIGNMENT FOR TUNER 94D91-1

Connect the negative lead of a 3 volt battery thru a 10KΩ to the tuner AGC.
Connect the positive lead to chassis. If a usable indication cannot be obtained on scope. Remove bias supply from tuner AGC point and connect a short jumper from IF AGC to chassis.
If a separate marker generator is used, couple it loosely to antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminal with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 15KΩ to point D . Low side to chassis.	A22, A23	Adjust for response curve similar to Fig.3.
3.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A24	"
4.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig.3. If markers fall below 70% on any high band channel, make compromise adjustment of A22 and A23 with channel switch set to that channel. Check all other high band channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
5.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for response curve similar to Fig.3. If markers fall below 70% on any low band channel, make compromise adjustment of A24 with channel switch set to that channel. Check all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			



FIG, I

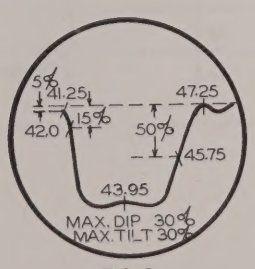


FIG.2

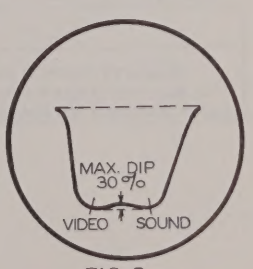


FIG. 3

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FIG. 4

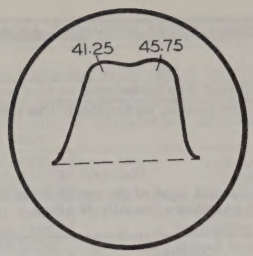

FIG. 5

FIG. 6

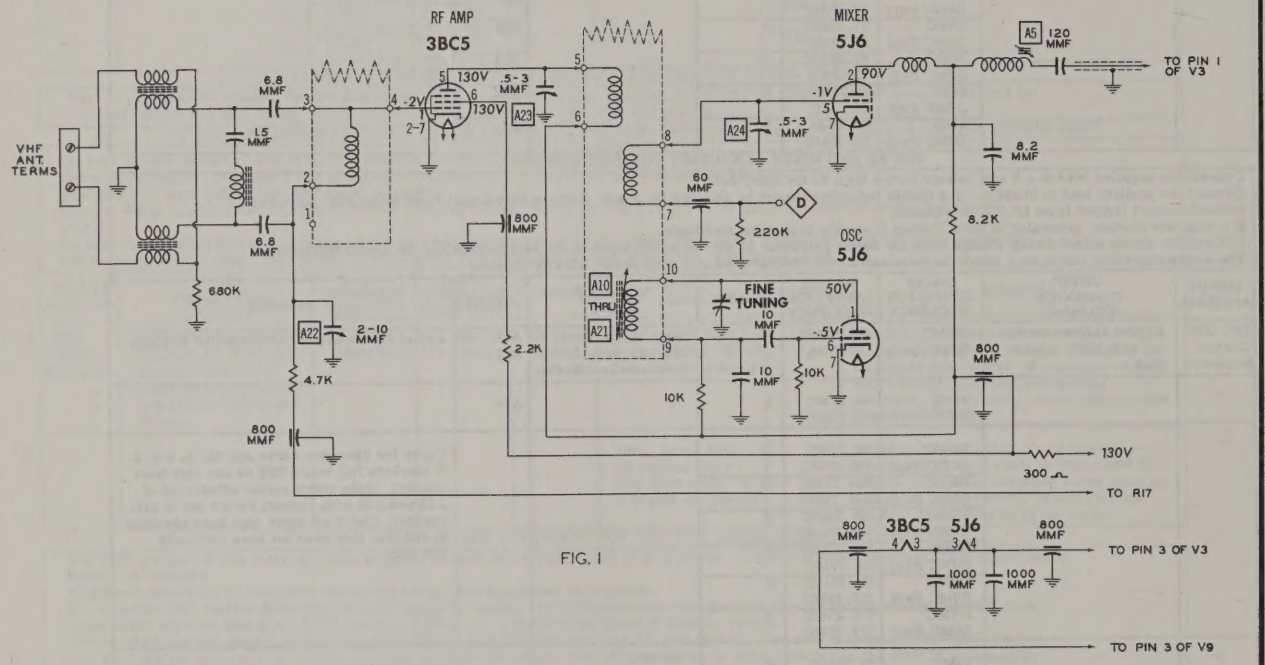

FIG. 1

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ARVIN MODELS
952P, 954P (Ch. RE389)

ARVIN MODELS
952P, 954P (Ch. RE389)

TRADE NAME	Arvin Models 952P, 954P (Ch. RE389)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1T4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATINGS	110-120 Volts AC-DC (or) 7.5 Volts "A" Supply & 90 Volts "B" Supply .15 Amp. @ 117 Volts AC (or) 55MA @ 7.5 Volts DC & 11.5 MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1600KC	"	"	A5	"
3.		Loop	1000KC	Tune to 1000KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

ARVIN
Model 952P

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1T4	1T4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	ARVIN PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■40	150	42999	FP314			
B	▲40	150					
C	250	10					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	ARVIN PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	20000			DD-203	817-02		
C3	47			D6-470	GP1K-470	UC-5447	
C4	20000			DD-203	817-02		
C5	5000		21674	DD-502	811-005	DC-525	
C6A	150		*41632	D6-151	GP2K-151	UC-5315	
B	2000			D6-202	GP2-333-202	UC-522	
C	100			D6-101	GP1K-101	UC-531	
D	10000			D6-103	GP3-333-103	DC-511	
E	5000			DD-502	GP2-333-502	UC-525	
C7	3300			DD-332	811-0033	UC-5233	
C8	20000			DD-203	817-02		
C9	.1	200		DF-104		PT401	
C10	20000			DD-203	817-02		
C11	.1	400		DF-104		PT401	

* Items C6A, C6B, C6C, C6D, C6E, R10A, R10B, R10C and R10D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1Meg	½	A43040					Volume and switch

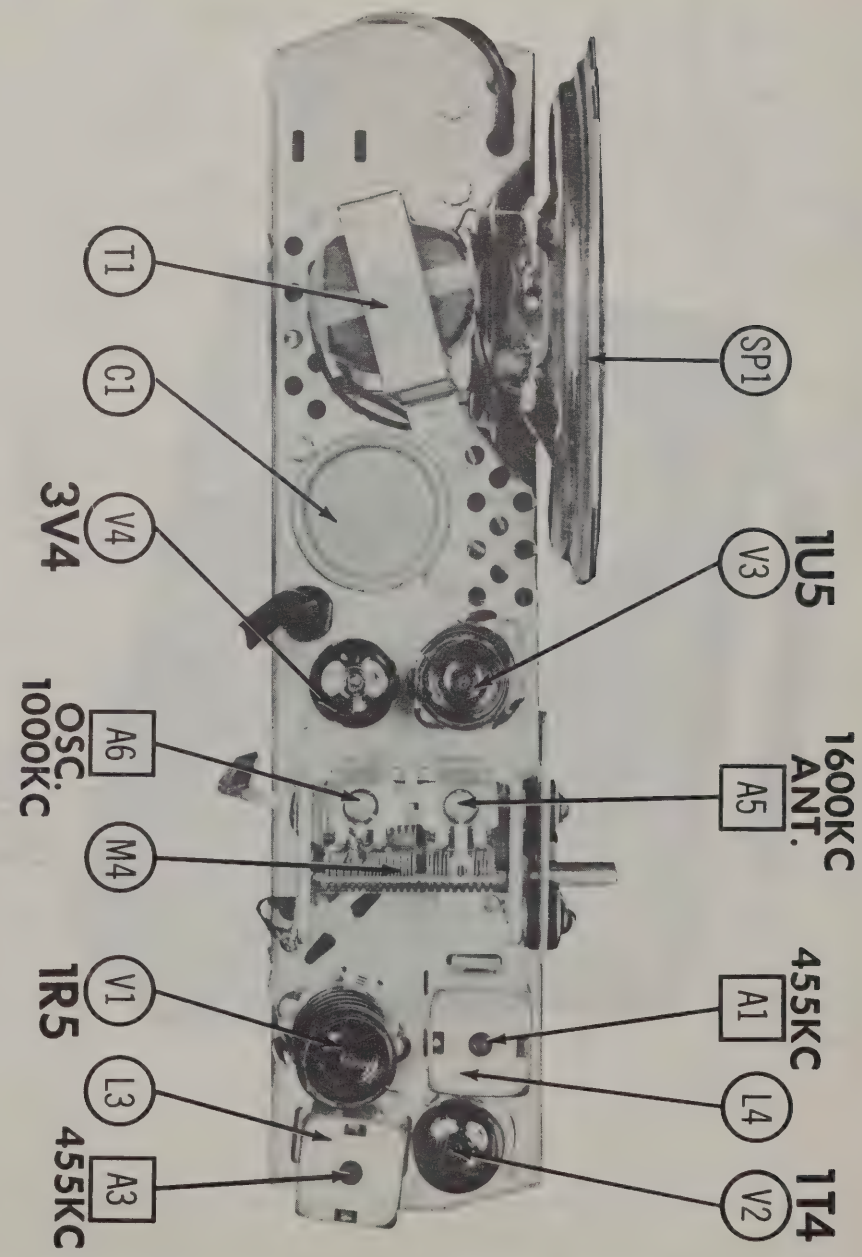
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	100KΩ 5%	½		BTS-100K	
R3	1Meg	½		BTS-1Meg	
R4	2.2Meg	½		BTS-2.2Meg	
R5	270Ω	½		BTS-270	
R6	560Ω	½		BTS-560	
R7	820Ω	½		BTS-820	
R8	2.2Meg	½		BTS-2.2Meg	
R9	5600Ω	½		BTS-5600	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R10A	10Meg	½	♦41632	BTS-10Meg	
B	4.7Meg	½		BTS-4.7Meg	
C	1Meg	½		BTS-1Meg	
D	1Meg	½		BTS-1Meg	
R11	1200Ω	½		BTS-1200	
R12	47Ω	1	19177		
R13	2200Ω	10	43012	1 3/4A-2250	
R14	1800Ω	1		BTA-1800	
R15	330KΩ	½		BTS-330K	

♦ Items C6A, C6B, C6C, C6D, C6E, R10A, R10B, R10C, R10D are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6.8KΩ	3.5Ω	42026-2	Z1110	A-2927 ①	A-3329	24S49	S-8X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	43067	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.6Ω						
L2	Osc. Coil	2.2Ω	8.5Ω	43150-1	14-1074	BC-394	70-OSC	
L3	Input IF	15Ω	15Ω	21797-2	16-6758	BC-352	12-C1	
L4	Output IF	26Ω	26Ω	21797-3	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ARVIN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M3	.067ADC	20207-5	1003	RS75	6S75	5M4	75	

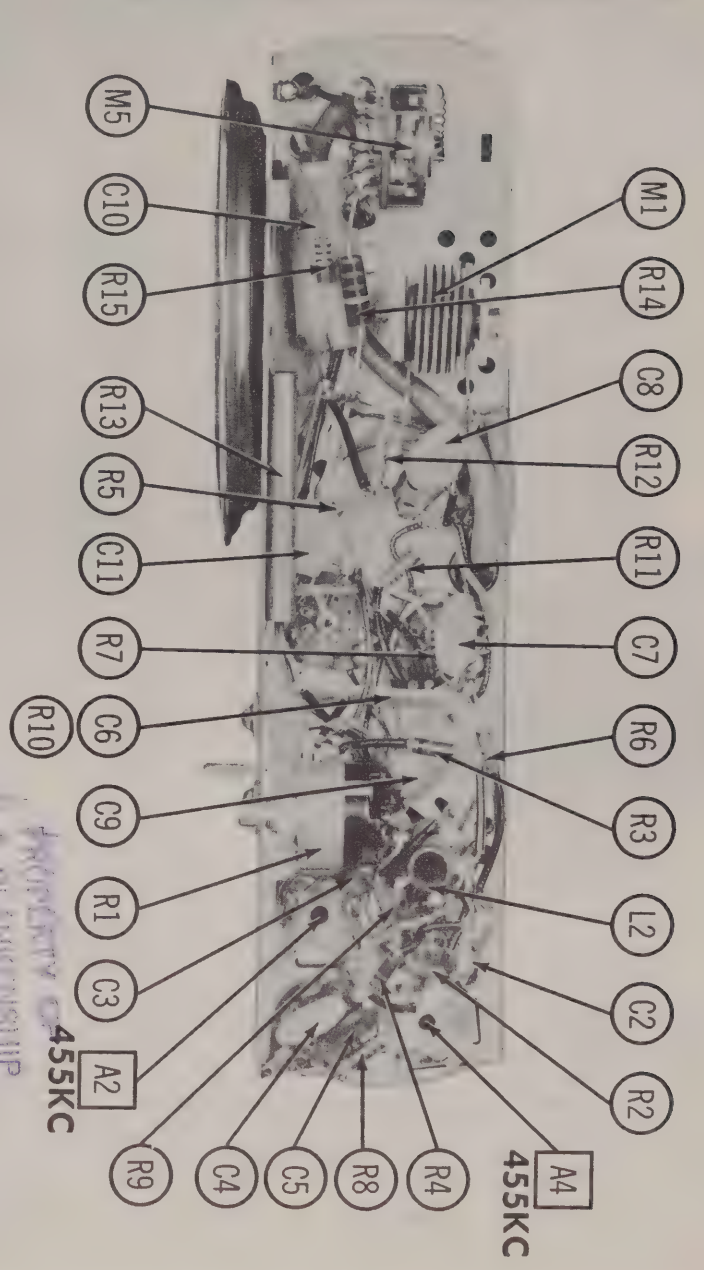
BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V "A"		717			C5			
M3	45V "B"			455			XX30		Connect 2 in series

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M4	Tuning Cap.	42998	2 Gang (14-345MMF, 13-115MMF)
M5	Switch	41806	Power Changeover (Rotary-wafer type) 3 pole, 2 position
	Cabinet Assy.	43134-1	Front (Maroon)
	Cabinet Assy.	43134-2	Front (Matador Red)
	Cabinet Assy.	43134-3	Front (Aqua)
	Cabinet Assy.	43134-4	Front (Cinnamon)
	Cabinet Assy.	43135-1	Rear with ant. loop (maroon)
	Cabinet Assy.	43135-2	Rear with ant. loop (Matador Red)
	Cabinet Assy.	43135-3	Rear with ant. loop (aqua)
	Cabinet Assy.	43135-4	Rear with ant. loop (cinnamon)
	Handle	43076-1	Maroon
	Handle	43076-2	Matador Red
	Handle	43076-3	Aqua
	Handle	43076-4	Cinnamon
	Knob	43074	On-off-volume & tuning
	Tuning Dial	43075	

CHASSIS—BOTTOM VIEW



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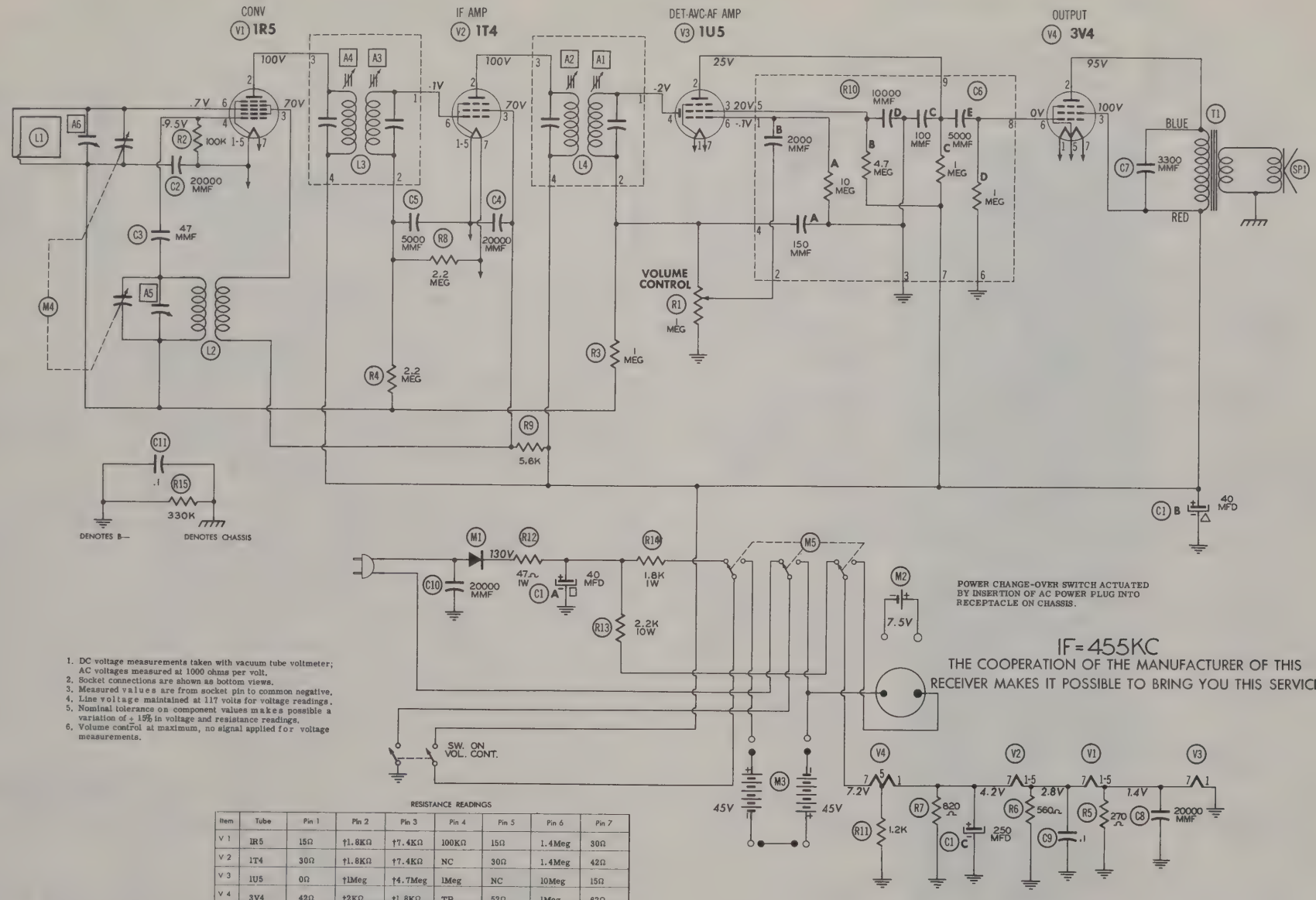
DENVER, COLORADO

ARVIN Model 952P



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	15Ω	†1.8KΩ	†7.4KΩ	100KΩ	15Ω	1.4Meg	30Ω
V 2	1T4	30Ω	†1.8KΩ	†7.4KΩ	NC	30Ω	1.4Meg	42Ω
V 3	1U5	0Ω	†1Meg	†4.7Meg	1Meg	NC	10Meg	15Ω
V 4	3V4	42Ω	†2KΩ	†1.8KΩ	TP	52Ω	1Meg	62Ω

† MEASURED FROM OUTPUT OF M1.
NC - NO CONNECTION.
TP - TIE POINT

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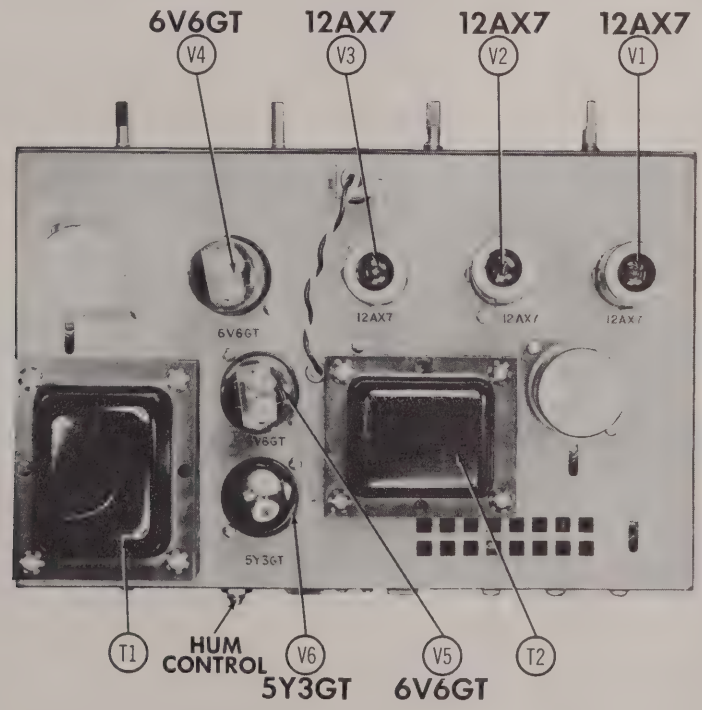
924 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODELS DB110, G

TRADE NAME	David Bogen Models DB110, DB110G
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York, 14, N.Y.
TYPE SET	AC Operated 5 Channel Audio Amplifier
TUBES (Six)	Types 12AX7 Preamp., 12AX7 AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .6 Amp. @ 117 Volts AC



DAVID BOGEN
MODELS DB110, G

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PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
Model DB110

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	Preamplifier	12AX7	12AX7	9A	
V2	AF Amplifier	12AX7	12AX7	9A	
V3	AF Amplifier-Phase Inverter	12AX7	12AX7	9A	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	David Bogen PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲10	450		FP396.2	TM-Q5-450	Q-030	
B	▲10	450					
C2A	■5	450		WP433.6	TM-Q5-450	Q-030	
B	▲5	450					
C	▲5	450					
D	5	450					
C3	50	50		TC39	TD-50-50	FM-0550	

FIXED CAPACITORS

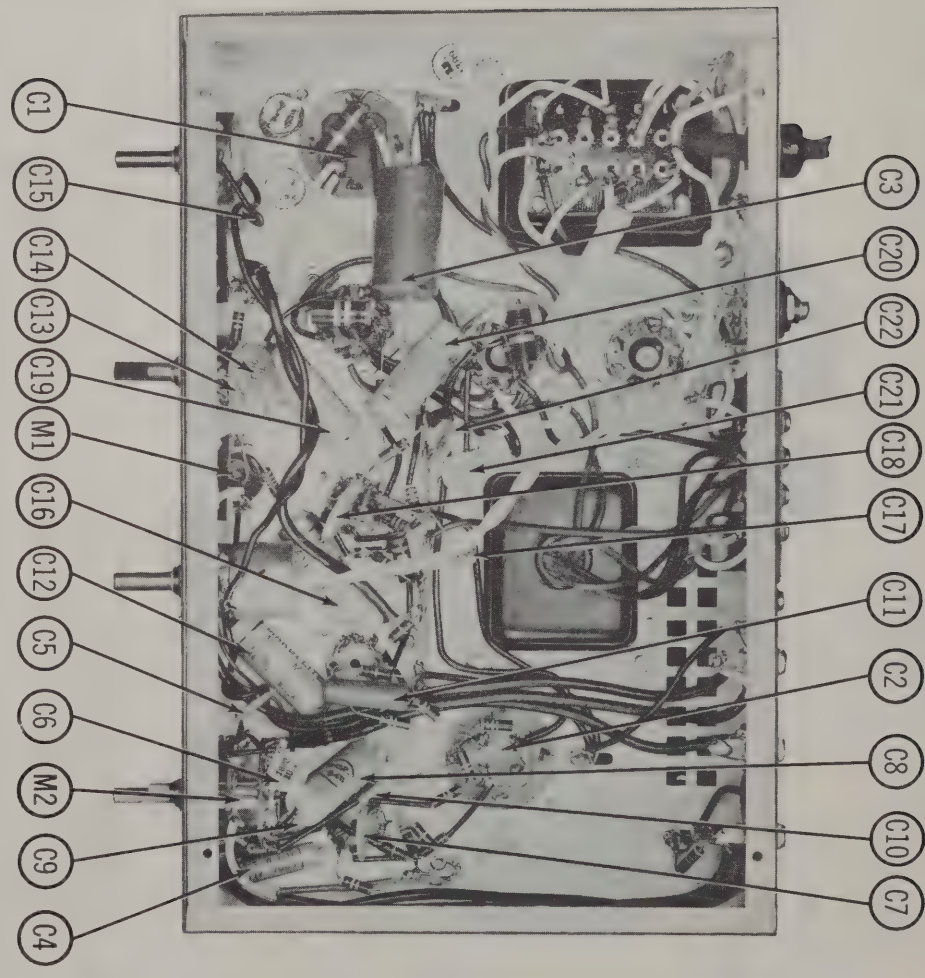
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	David Bogen PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C4	.033	200		DF-303		PT4133	
C5	1000				811-102		
C6	1800						
C7	10000			DD-103	811-01	DC-511	
C8	.1	400		DF-104		PT401	
C9	.0068	400		D6-682	GP3-333-682		
C10	1000				811-102		
C11	.0068	400		D6-682	GP3-333-682		
C12	.1	400		DF-104		PT401	
C13	3300						
C14	3300						
C15	100			DD-101	801-101	ZT-531	
C16	.1	400		DF-104		PT401	
C17	270			DD-271	811-271		
C18	4700						
C19	.1	400		DF-104		PT401	
C20	.1	400		DF-104		PT401	
C21	1000				811-102		
C22	1000				811-102		

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V323A	Q13-133	A47-500K-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	1Meg	½	V315C	Q11-137	A47-1Meg-S	B-69	U-54	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	V316C	Q19-133X	A47F5-500K	BT-65	UT-431	Treble tapped @250KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	50Ω	½	V113	W-50	A43-50	VK-116	C50P	Hum Balance
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R5	47KΩ	1/2		BTS-47K	
R6	100KΩ	1/2		BTS-100K	
R7	470KΩ	1/2		BTS-470K	
R8	68KΩ	1/2		BTS-68K	
R9	1500Ω	1/2		BTS-1500	
R10	1Meg	1/2		BTS-1Meg	
R11	100KΩ	1/2		BTS-100K	
R12	3300Ω	1/2		BTS-3300	
R13	47KΩ	1/2		BTS-47K	
R14	47KΩ	1/2		BTS-47K	
R15	100KΩ	1/2		BTS-100K	
R16	100KΩ	1/2		BTS-100K	
R17	1800Ω	1/2		BTS-1800	
R18	100KΩ	1/2		BTS-100K	
R19	2200Ω	1/2		BTS-2200	
R20	68KΩ	1/2		BTS-68K	
R21	470KΩ	1/2		BTS-470K	
R22	68KΩ	1/2		BTS-68K	
R23	68KΩ	1/2		BTS-68K	Note 1
R24	47KΩ	1/2		BTS-47K	
R25	39KΩ	1/2		BTS-39K	
R26	3.3Meg	1/2		BTS-3.3Meg	
R27	33KΩ	1/2		BTS-33K	
R28	470KΩ	1/2		BTS-470K	
R29	2700Ω 5%	1/2		BTS-2700 5%	
R30	1Meg	1/2		BTS-1Meg	
R31	100KΩ 5%	1/2		BTS-100K 5%	
R32	100KΩ 5%	1/2		BTS-100K 5%	
R33	200KΩ 5%	1/2		BTS-200K 5%	
R34	200KΩ 5%	1/2		BTS-200K 5%	
R35	12KΩ 5%	1/2		BTS-12K 5%	
R36	300Ω	7		PW7-300	
R37	100KΩ	2		BTB-100K	
R38	100KΩ	2		BTB-100K	
R39	2.7Ω	1		BTA-2.7	
R40	22KΩ	1/2		BTS-22K	
R41	5600Ω	2		BTB-5600	

Note 1. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .6A	700VCT .079ADC	5VAC @ 2A	6.3V 1.8A	T362-3	P9311 ①	P-2952 ①	PM8409 ①	24R04 ①	R-11B ①

① Tape 6.3V center tap.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	11KΩ CT	16Ω tap @ 8Ω,4Ω	T2106-1				22S93 ①		① Fabricate mounting.

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Pilot Light		#47
M2	Switch		Selector & record compensation (rotary-wafer type)

PROPERTY OF
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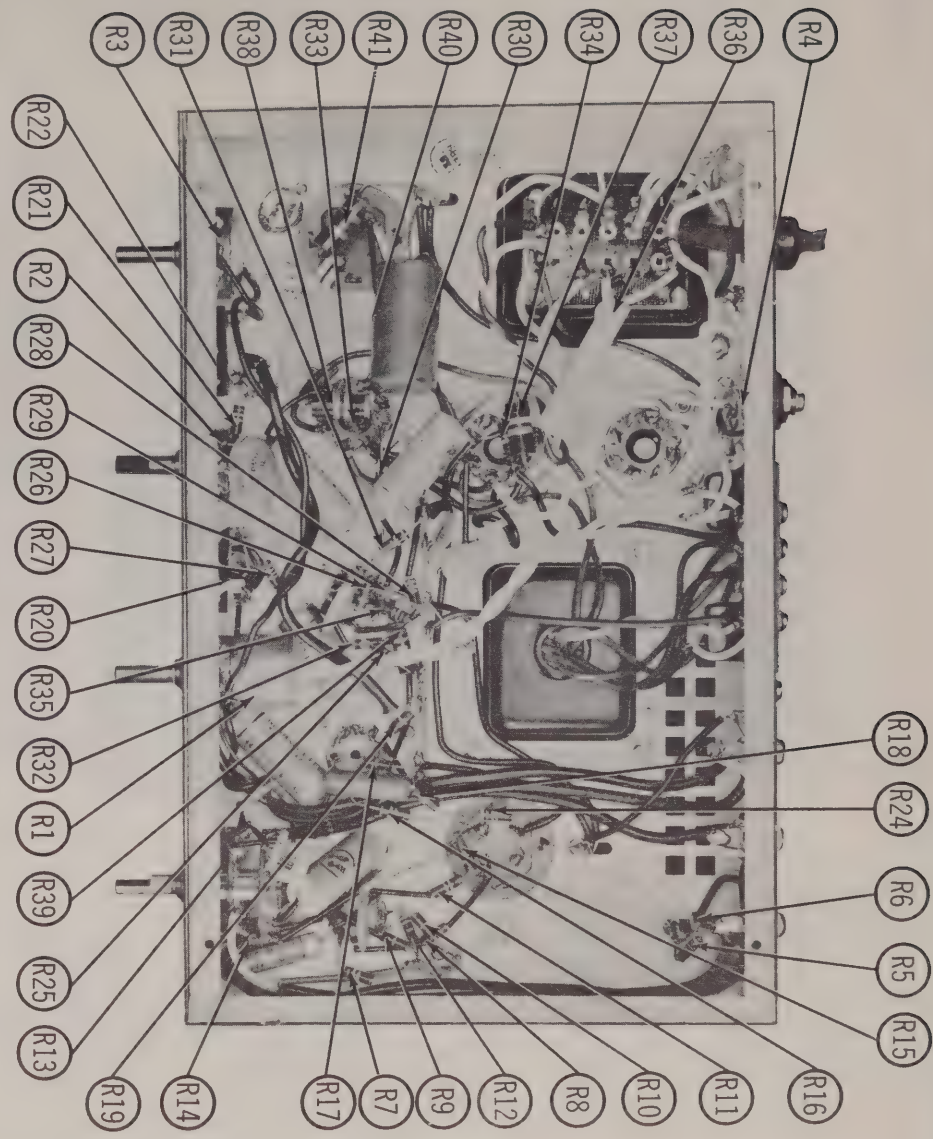
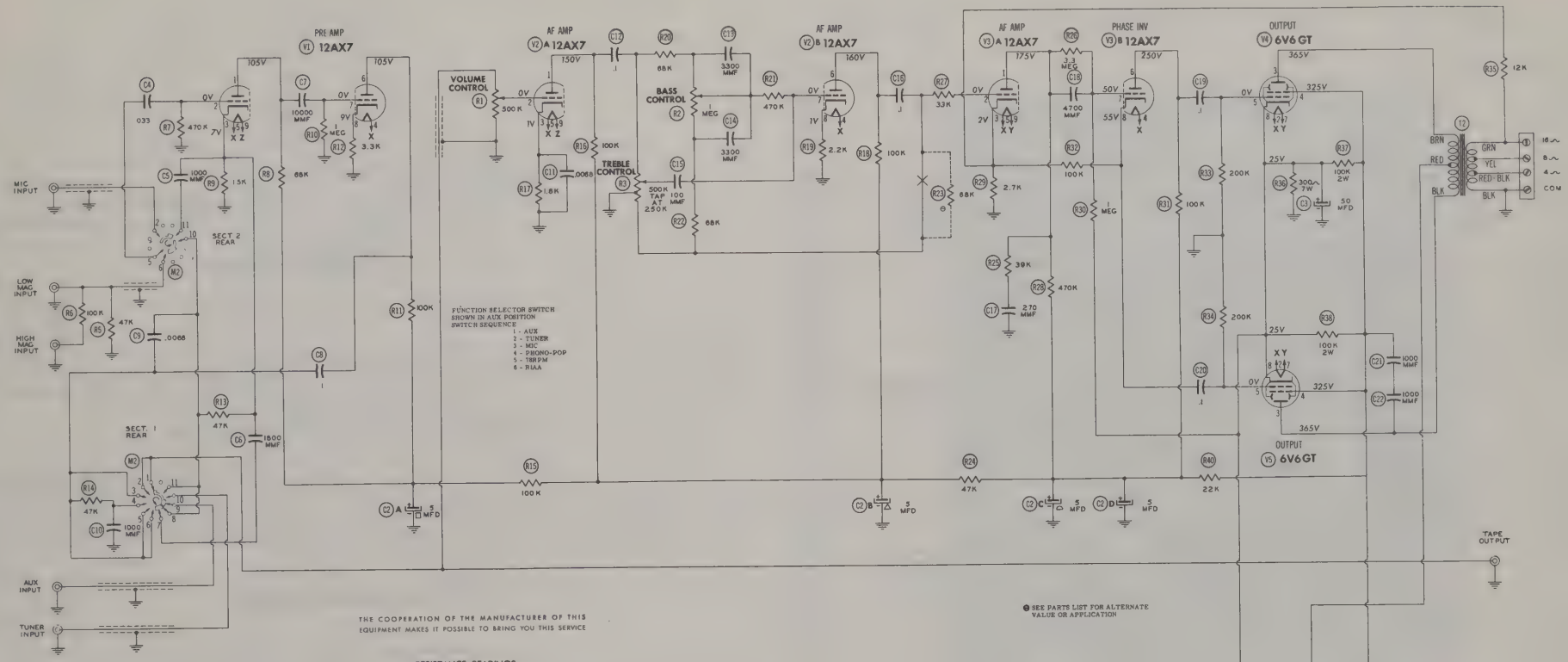
7444 MEADE ST.
DENVER, COLORADO

CHASSIS—BOTTOM VIEW



DAVID BOGEN
Model DB110



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†237KΩ	470KΩ	1.5KΩ	325Ω	325Ω	†269KΩ	1Meg	3.3KΩ	325Ω
V 2	12AX7	†169KΩ	15Ω	1.8KΩ	325Ω	325Ω	†169KΩ	788KΩ	2.2KΩ	325Ω
V 3	12AX7	†492KΩ	300KΩ	2.7KΩ	325Ω	325Ω	†122KΩ	†800KΩ	102KΩ	325Ω
V 4	6V6GT	TP	325Ω	†350Ω	†5.6KΩ	200KΩ	TP	325Ω	300Ω	
V 5	6V6GT	TP	325Ω	†350Ω	†5.6KΩ	200KΩ	TP	325Ω	300Ω	
V 6	5Y3GT	NC	50KΩ	NC	150Ω	NC	150Ω	NC	50KΩ	

† MEASURED FROM PIN 8 OF V6.
■ 6.3VAC MEASURED ACROSS FILAMENT
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

EMERSON MODELS
819B, 820B (Ch. 120240-B)

EMERSON MODELS
819B, 820B (Ch. 120240-B)

TRADE NAME	Emerson Models 819B, 820B, (Ch. 120240-B)
MANUFACTURER	Emerson Radio & Phono Corp., 14th & Coles Sts., Jersey City 2, N. J.
TYPE SET	AC Operated Phono Amplifier (Model 819B-3 Speed Manual Player---Model 820B-3 Speed Automatic Record Changer)
TUBES (Four)	Types: 12AX7 AF Amp. -Phase Inv., (2) 35L6GT Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .28 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT 819077 USED IN MODEL 820B SEE SIMILAR V-M MODEL 950 COVERED IN PHOTOFACT SET #216-FOLDER #11 OR RECORD CHANGER MANUAL CM-5.

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PARTS LIST AND DESCRIPTIONS

EMERSON
Model 819B

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		EMERSON PART No.	STANDARD REPLACEMENT		
V1	AF Amp. - Phase Inv.	12AX7	12AX7	9A	
V2	Audio Output	35L6GT	35L6GT	7S	
V3	Audio Output	35L6GT	35L6GT	7S	
V4	Rectifier	35Z5GT	35Z5GT	6AD	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	EMERSON PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	40	150	925248	TCT3117	TDL-804020-150		
B	80	150					
C	20	150					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	EMERSON PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.0047	600	923753	D6-472	GP2-333-472	PT6247	
C3	.1	400	922515	DF-104		PT401	
C4	.047	200	922354	DF-503		PT4147	
C5	.033	200	922234	DF-303		PT4133	
C6	.047	200	922254				
C7	220	500	911165	TCZ-220	NPO-335-221		
C8	.1	200	922203				
C9	.1	200	922203				
C10	.039	400	922202				
C11	.047	400	922554	DF-503		PT4147	

CONTROLS

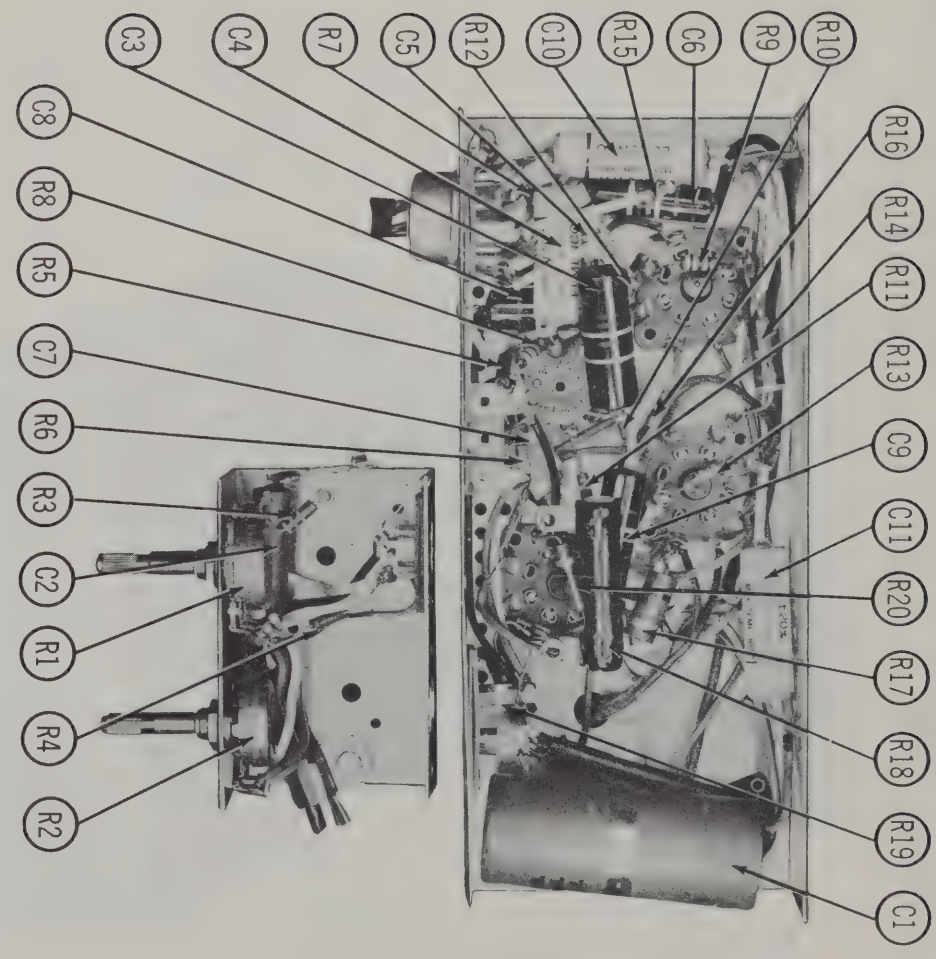
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	3.25Meg		390244					Volume, Tapped at 260KΩ
R2A	7500Ω		390245	Q11-115	A47-7500-S	AB-13	U-20	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R3	47KΩ	½	350892	BTS-47K	
R4	2.2Meg	½	351292	BTS-2.2Meg	
R5	10Meg	½	351452	BTS-10Meg	
R6	220KΩ	½	331052	BTS-220K 5%	
R7	4700Ω	½	330652	BTS-4700 5%	
R8	4300Ω	½	330642	BTS-4300 5%	
R9	47KΩ	½	330892	BTS-47K 5%	
R10	220KΩ	½	331052	BTS-220K 5%	
R11	10KΩ	½	330732	BTS-10K 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R12	470KΩ	½	331132	BTS-470K 5%	
R13	470KΩ	½	331132	BTS-470K 5%	
R14	75Ω	2	770222	BTB-75 5%	
R15	4700Ω	½	330652	BTS-4700 5%	
R16	10KΩ	½	330732	BTS-10K 5%	
R17	100Ω	2	780252	BTB-100	
R18	560Ω	10	394145		
R19	56Ω	2	780192	BTB-56	
R20	22Ω	1	370092	BTA-22	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4.8KΩ	1.8Ω RES Tap @ .8Ω	734093						

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA EMERSON PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.6Ω	180126	6A1	
SP2	6"	PM	3.6Ω	180126	6A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA EMERSON PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	960826 (or) 960993	55-T	GD-J	47	0-1 or S-1 and 0-3	

PHONO NEEDLE

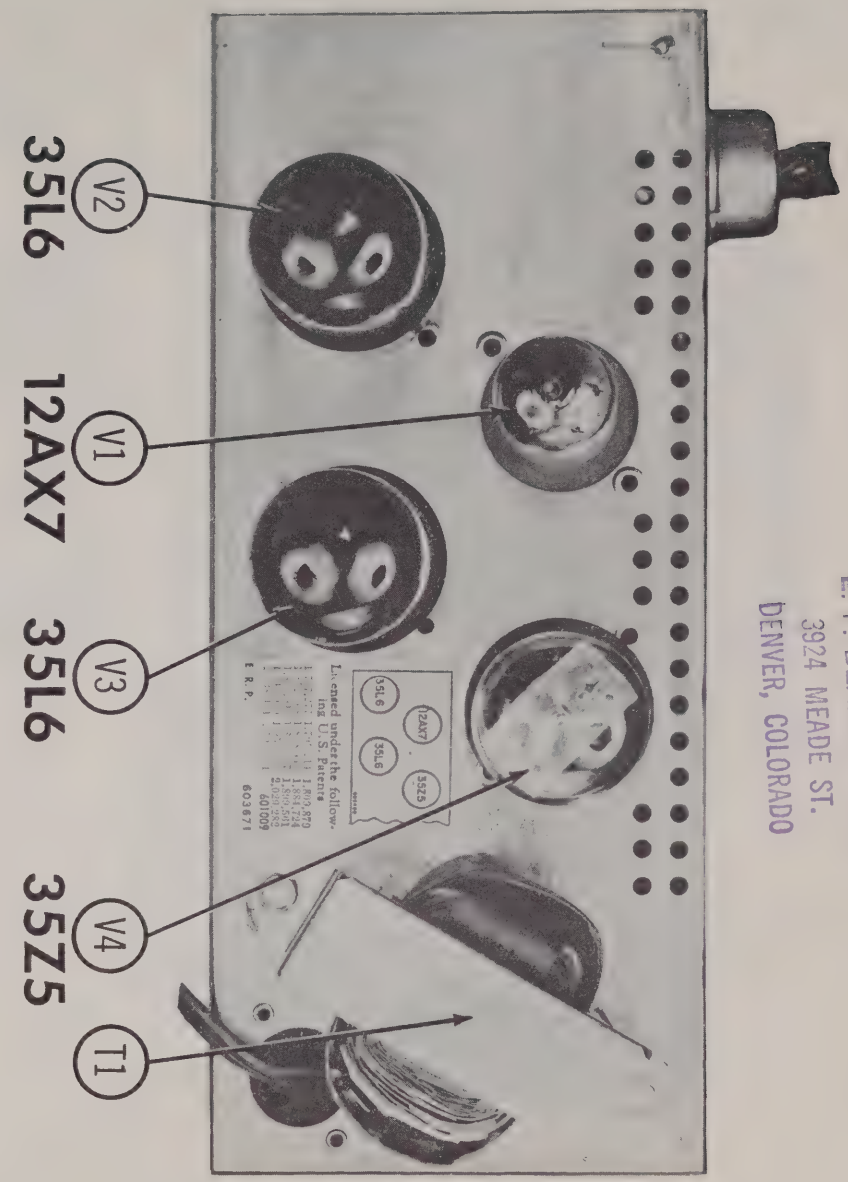
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA EMERSON PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	960827	*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†AC-434 OR ♦†AC-434D1 or †♦AC-434D2 or ♦AC-434D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond Used in Model 820B, Cartridge Part #980826.
M2	960994	*A-72 or †A-71 or ♦†A-71SD or ♦A-71D		†W-8TPS or ♦†W-8DS or ♦W-8TPD	Used in Model 819B, Cartridge Part #960993.

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Switch	510105	On-Off Model 819B
	Cabinet	140629	Slate Blue-Model 819B
	Cabinet	140629A	Dark Brown-Model 819B
	Cabinet	140629B	Green-Model 819B
	Cabinet	140616	Portable-Model 820B
	Knob	460532B	Tone & Volume-Model 819B
	Knob	460619	On-Off Switch-Model 819B
	Knob	460532A	Tone & Volume-Model 820B

CHASSIS—BOTTOM VIEW



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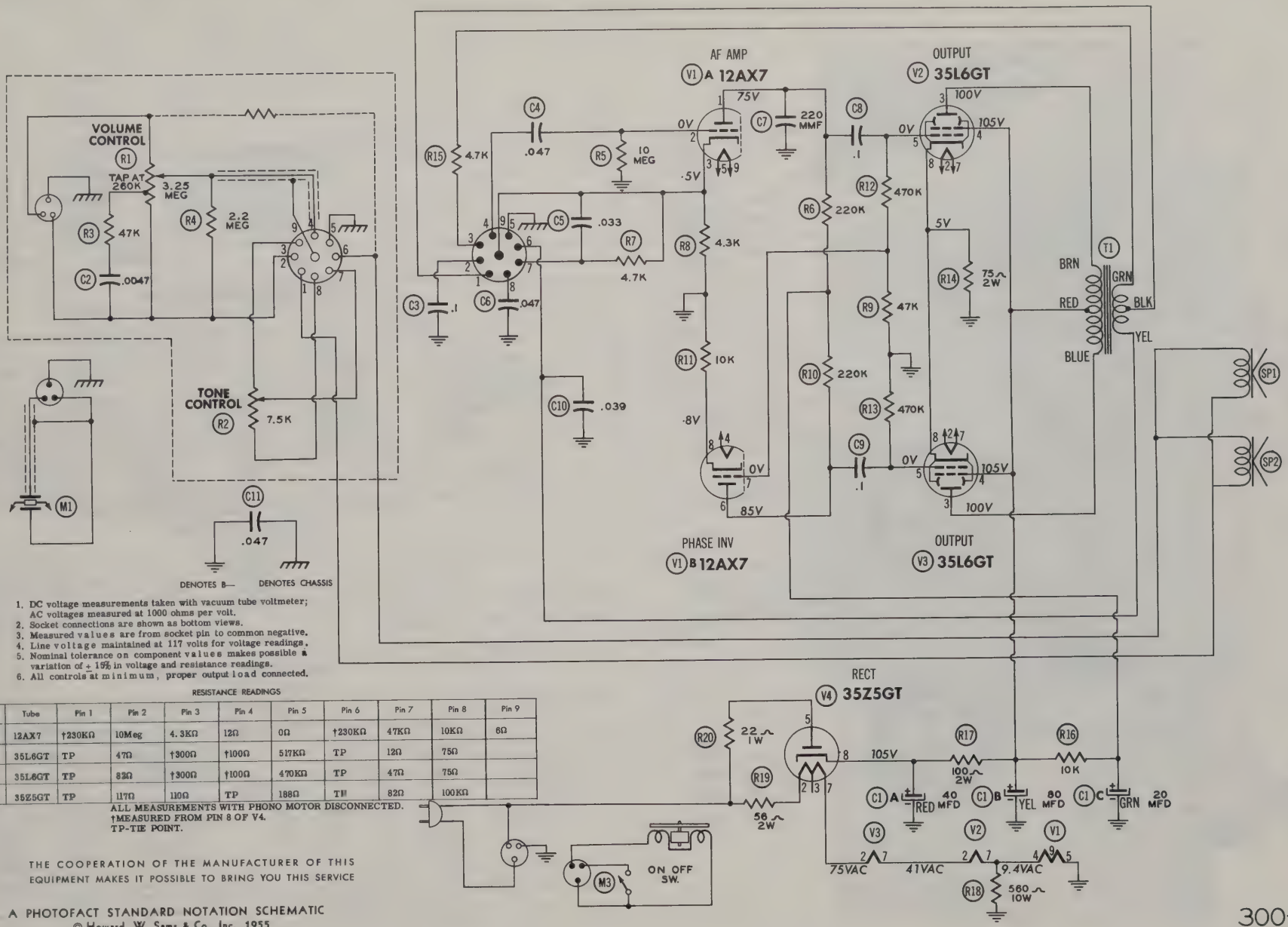

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†230KΩ	10Meg	4.3KΩ	12Ω	0Ω	†230KΩ	47KΩ	10KΩ	6Ω
V 2	35L6GT	TP	47Ω	†300Ω	†100Ω	517KΩ	TP	12Ω	75Ω	
V 3	35L6GT	TP	82Ω	†300Ω	†100Ω	470KΩ	TP	47Ω	75Ω	
V 4	35Z5GT	TP	117Ω	110Ω	TP	188Ω	TP	82Ω	100KΩ	

ALL MEASUREMENTS WITH PHONO MOTOR DISCONNECTED.
†MEASURED FROM PIN 8 OF V4.
TP-TIE POINT.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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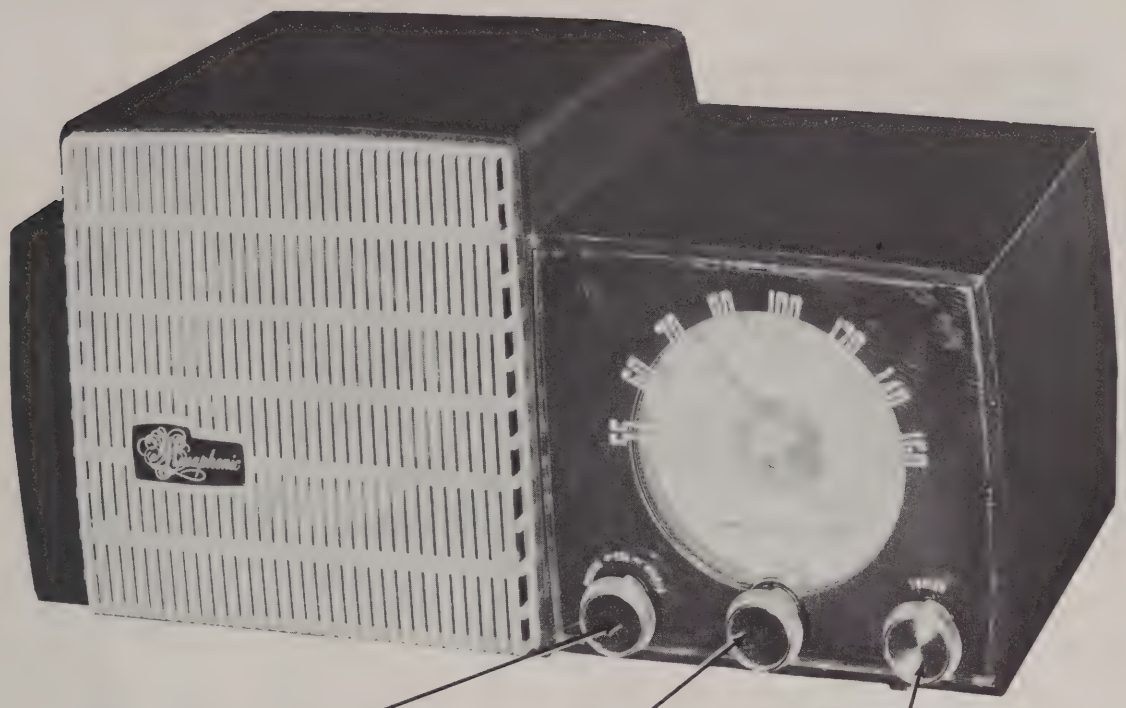
GENERAL ELECTRIC
MODEL 480



GENERAL ELECTRIC
MODEL 480

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TRADE NAME	General Electric Model 480
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, New York
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1500KC	Tune to 1500KC signal.	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal.	"	A8	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		General Electric PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V5	Audio Output	35C5	35C5	7CV	
V6	Rect.	35W4	35W4	5BQ	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	General Electric PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	100	150	RCE-166	TCT3117	TDL-804020-150		
B	50	150					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	General Electric PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.05	400	UCC-045	DF-503		PT415	
C3	100		RCW-3079				
C4	8.2		RCW-3214		N POA-8R2		
C5	47		RCW-3075				
C6	100		RCW-3079	DD-101	811-101	UC-531	
C7	220		RCW-2195	DD-221	811-221	UC-5322	
C8	.02	400	RCC-129	DF-203	817-02	PT412	
C9	220		RCW-2195	DD-221	811-221	UC-5322	
C10	.02	400	RCC-129	DF-203	817-02	PT412	
C11A	5000		RCW-3104	DD-502	811-005		
B	6800			D6-682	811-0068		
C12	.047	200	RCC-126	DF-503		PT4147	
C13	.022	200	RCC-127	DF-203	817-02	PT4122	
C14	.1	200	RCC-128	DF-104		PT401	
C15	.047	600	RCN-053	DF-503		PT6147	
C16	.05	600	UCC-045	DF-503		PT615	

CONTROLS

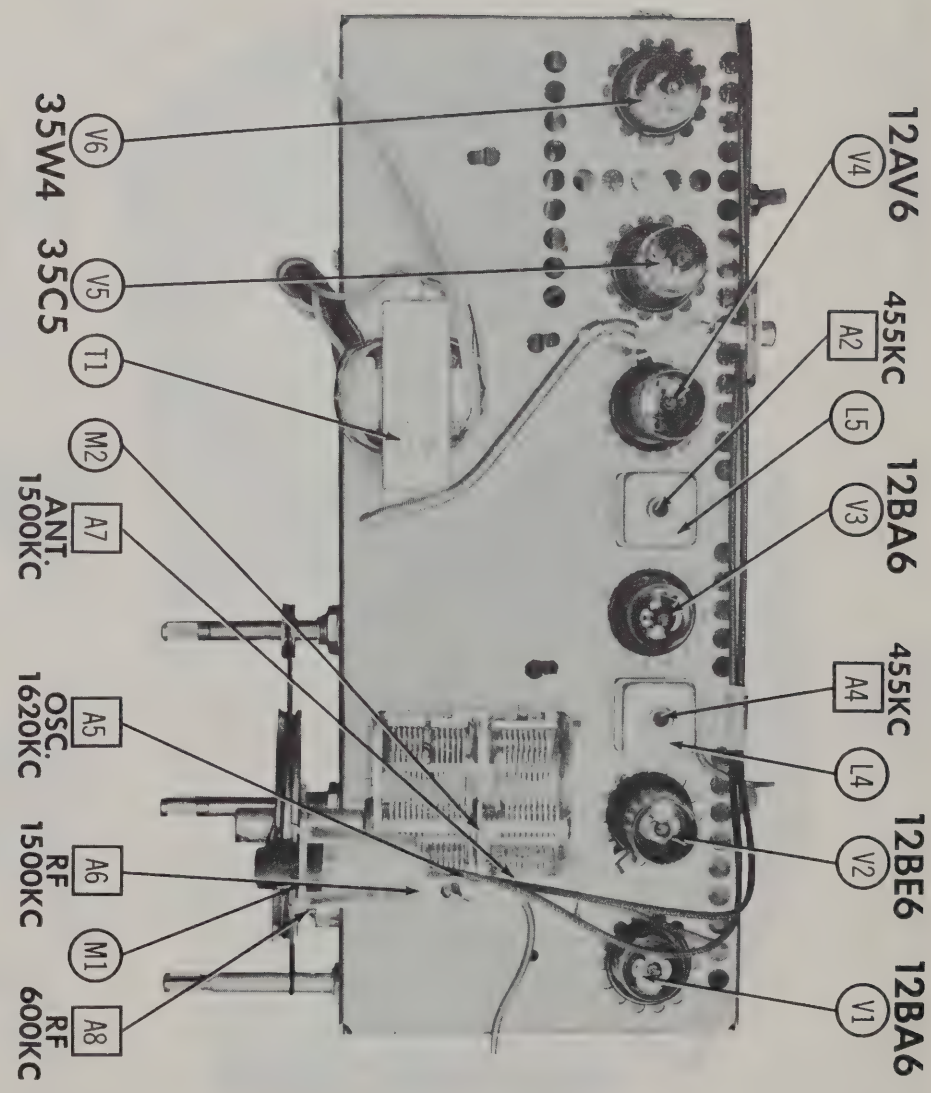
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	4Meg	½	RRC-331					Volume & Radio-Phono Switch (Tap at 2Meg)
R2A	250K	½	RRC-332	Q13-130	A47-250K-Z	AB-51	U-44	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A.
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R2A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R3	22Ω	½	URD-009	BTS-22	
R4	22KΩ	½	URD-081	BTS-22K	
R5	100Ω	½	URD-025	BTS-100	
R6	1.5Meg	½	URD-125	BTS-1.5Meg	
R7	120Ω	½	URD-027	BTS-120	
R8	2.2Meg	½	URD-129	BTS-2.2Meg	
R9	33KΩ	½	URD-085	BTS-33K	
R10	330KΩ	½	URD-109	BTS-330K	
R11	6.8Meg	½	URD-141	BTS-6.8Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R12	470KΩ	½	URD-113	BTS-470K	
R13	470KΩ	½	URD-113	BTS-470K	
R14	1000Ω	2	URF-049	BTB-1000	
R15	4700Ω	½	URD-065	BTS-4700	
R16	150Ω	½	URD-029	BTS-150	
R17	4700Ω	½	URD-065	BTS-4700	
R18	820Ω	½	URD-047	BTS-820	
R19	15KΩ	½	URD-077	BTS-15K	
R20	18Ω	½	URD-007	BTS-18	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA General Electric PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.4KΩ	3.4Ω SEC 2 61Ω RES	RTO-145						

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA General Electric PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.4Ω	S-625D7	6A1	

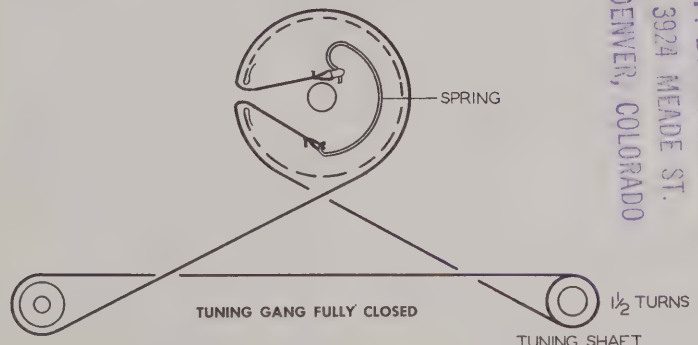
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.5Ω		RLL-060				
L2	RF Coil	32Ω	12ΩCT	RLB-034				
L3	Osc. Coil	.5Ω	8.2Ω	RLC-126	14-1074	BC-387		
L4	Input IF	14Ω	14Ω	RTL-143	16-6758*	BC-352*	12-C1*	
L5	Output IF	14Ω	14Ω	RTL-143	16-6758*	BC-353*	12-C2*	

* Terminal connections sufficient mounting support.

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Dial Light		#44
M2	Tuning Cap.	RCT-082	3 Gang (17-300MMF, 18-125MMF)
M3	Switch	RSS-009	Local-distance (SPDT-Slidetype)
	Cabinet	RAU-454	
	Knob	RDK-425	Tuning & Volume
	Knob	RDK-507	Tone
	Dial Pointer	RDP-079	
	Dial Window & Scale	RDW-093	
	Dial Back Plate	RDG-012	



DIAL CORD STRINGING

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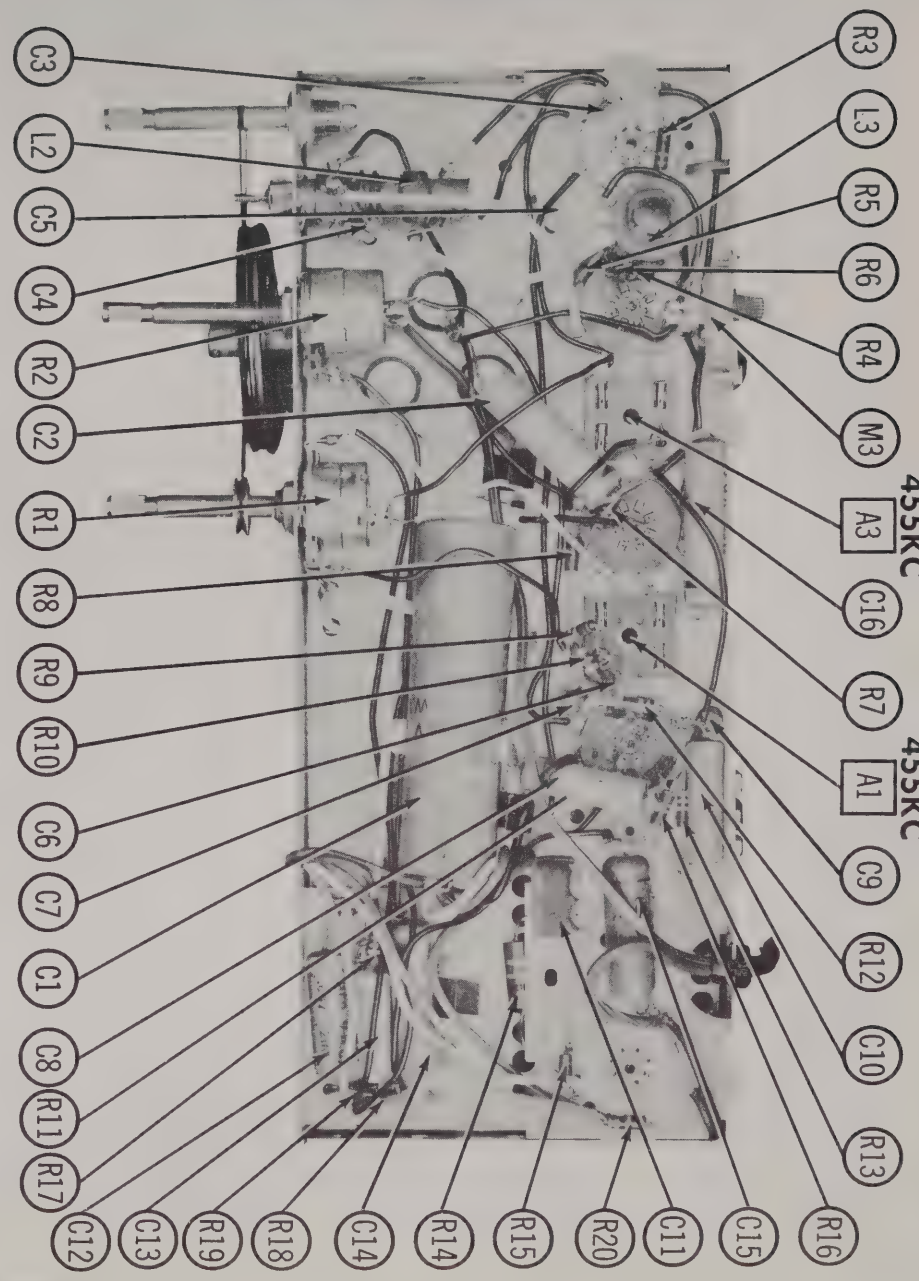
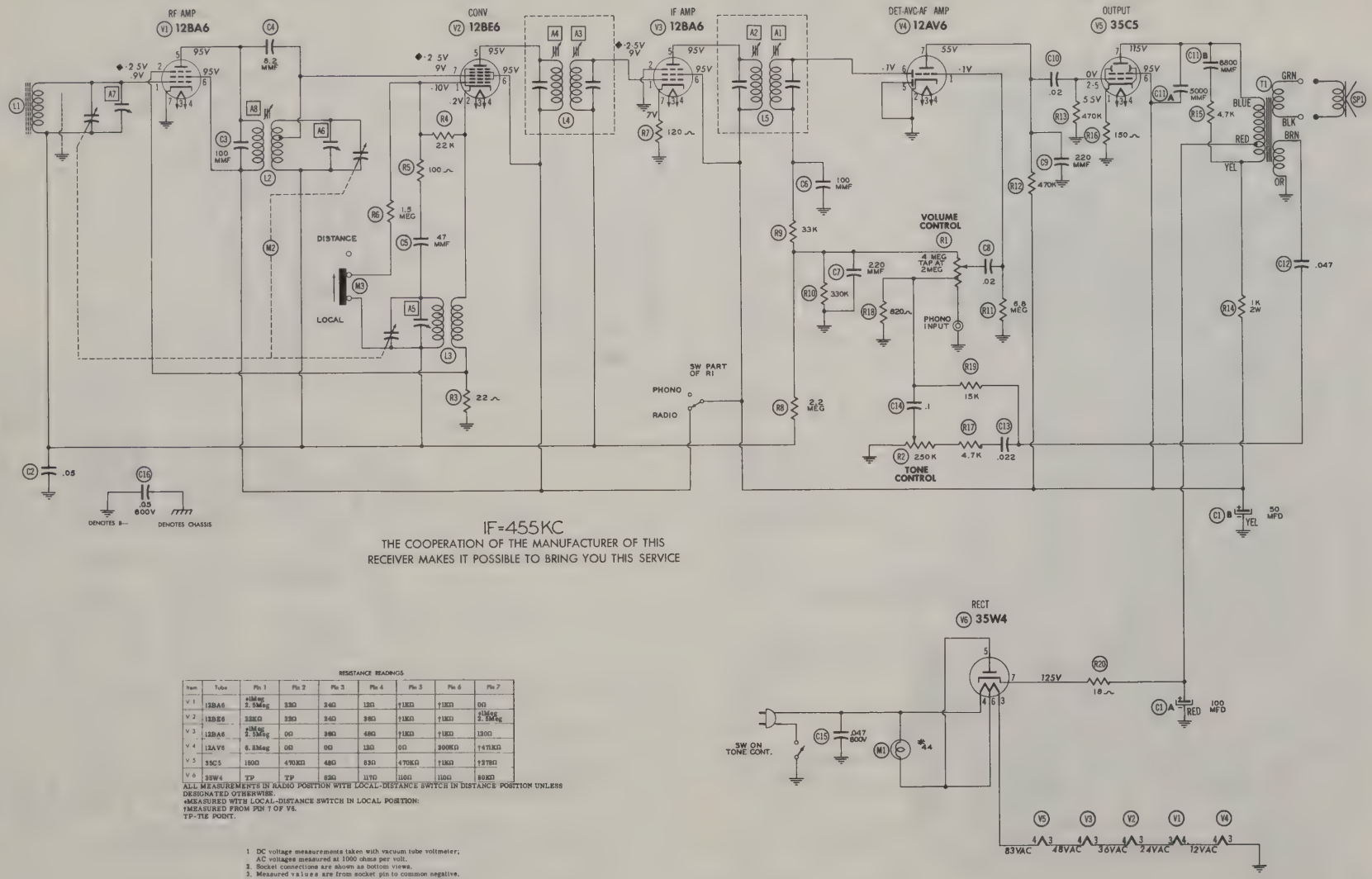
CHASSIS—BOTTOM VIEW



GENERAL ELECTRIC Model 480



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS
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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	*1Meg 2.5Meg	22Ω	24Ω	12Ω	†1KΩ	†1KΩ	0Ω
V 2	12BE6	33KΩ	22Ω	24Ω	39Ω	†1KΩ	†1KΩ	*1Meg 2.5Meg
V 3	12BA6	*1Meg 2.5Meg	0Ω	39Ω	48Ω	†1KΩ	†1KΩ	130Ω
V 4	12AV6	6.8Meg	0Ω	0Ω	13Ω	0Ω	300KΩ	†47KΩ
V 5	35C5	180Ω	470KΩ	48Ω	83Ω	470KΩ	†1KΩ	†378Ω
V 6	35W4	TP	TP	82Ω	117Ω	110Ω	110Ω	80KΩ

ALL MEASUREMENTS IN RADIO POSITION WITH LOCAL-DISTANCE SWITCH IN DISTANCE POSITION UNLESS DESIGNATED OTHERWISE.
*MEASURED WITH LOCAL-DISTANCE SWITCH IN LOCAL POSITION:
†MEASURED FROM PIN 7 OF V6.
TP-TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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HALLICRAFTERS MODELS 24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D)

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MODEL 27K250M

HALLICRAFTERS MODELS 24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D)

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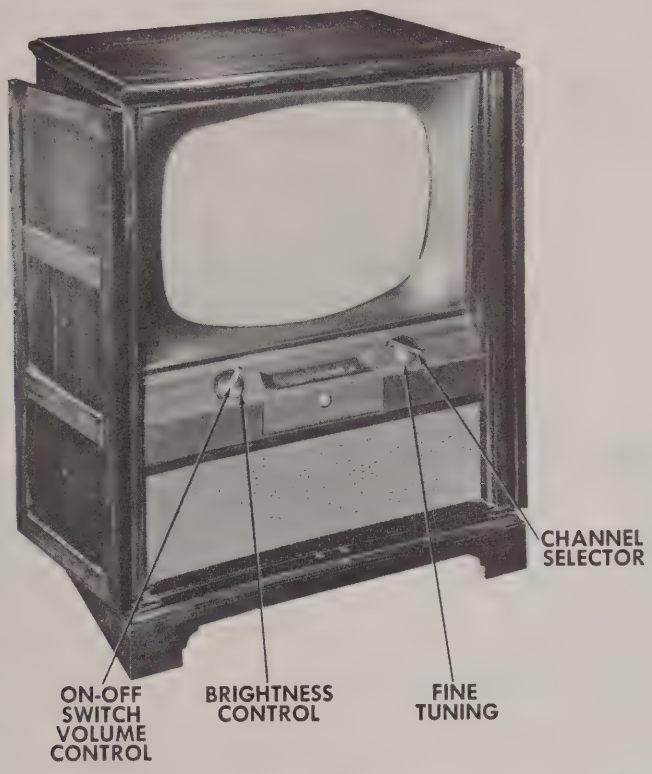

HALLICRAFTERS MODEL 27K250M

TRADE NAME	HALLICRAFTERS MODELS	CHASSIS
	24K241B, 24K241M, 27K251B, 27K251M.	C1400D
	24K240B, 24K240M, 27K250B, 27K250M.	D1400D
MANUFACTURER	Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Illinois	
TYPE SET	Television Receiver	
TUBES	Twenty-four	
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.4 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25 MC (Intercarrier)	

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HALLICRAFTERS MODELS 24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D)

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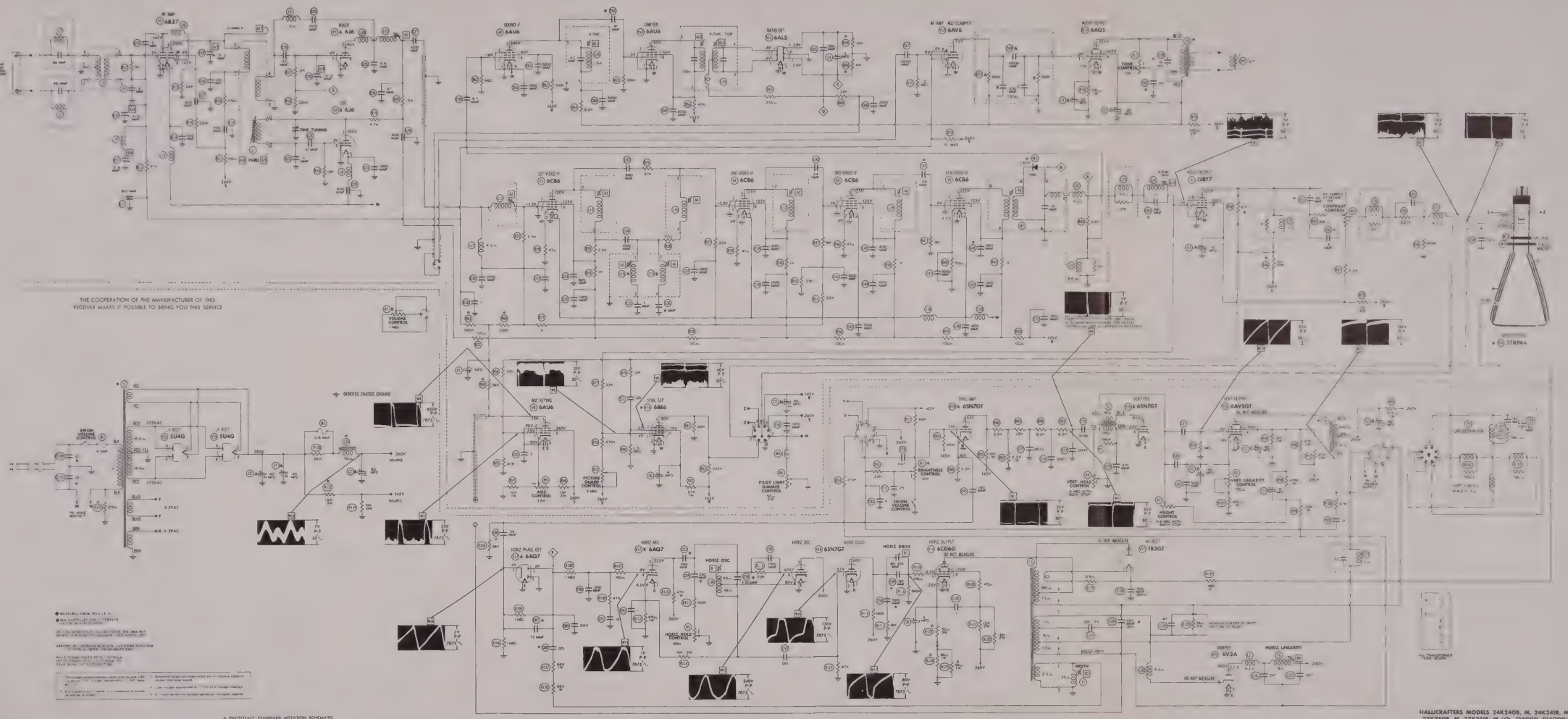
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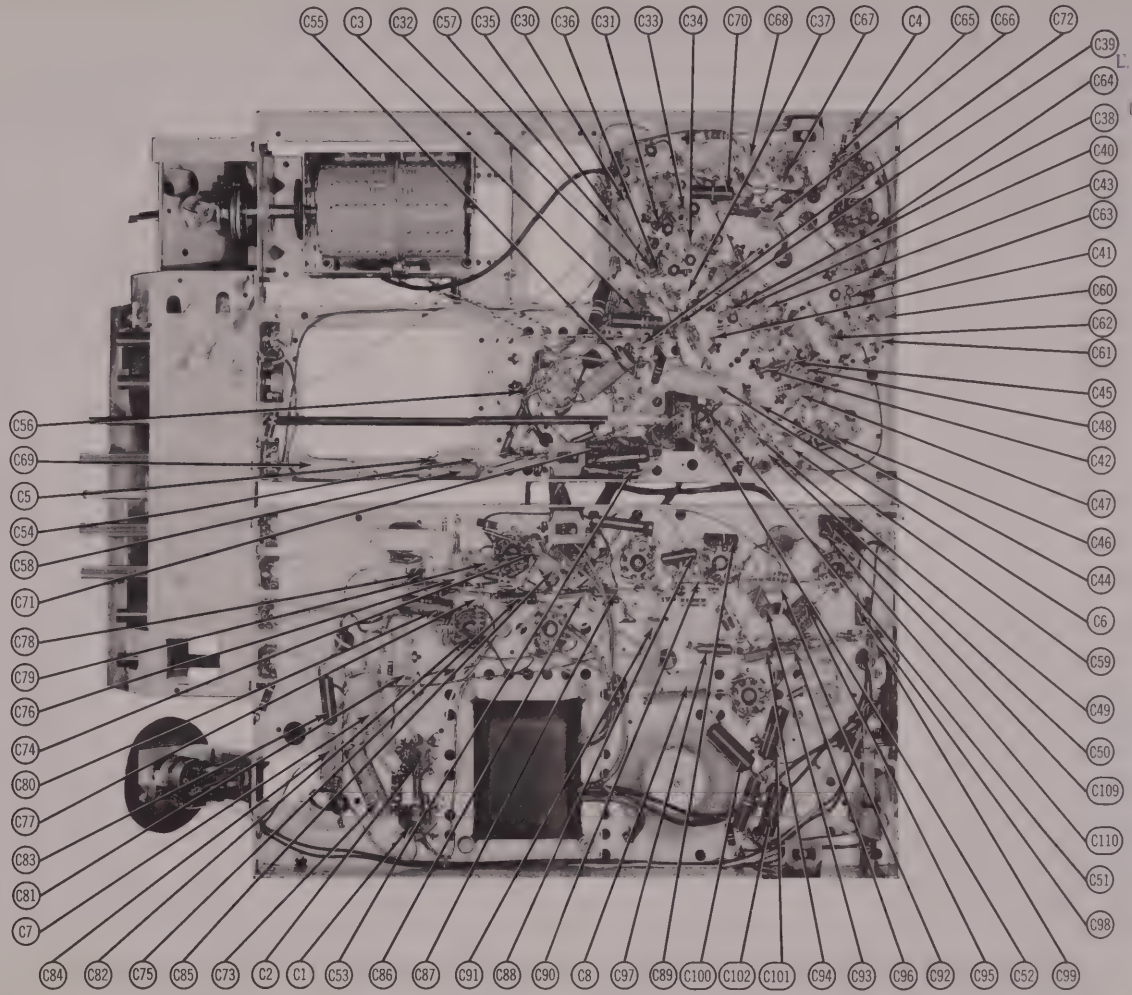
CHASSIS TOP VIEW

HALLICRAFTERS MODELS 24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D)



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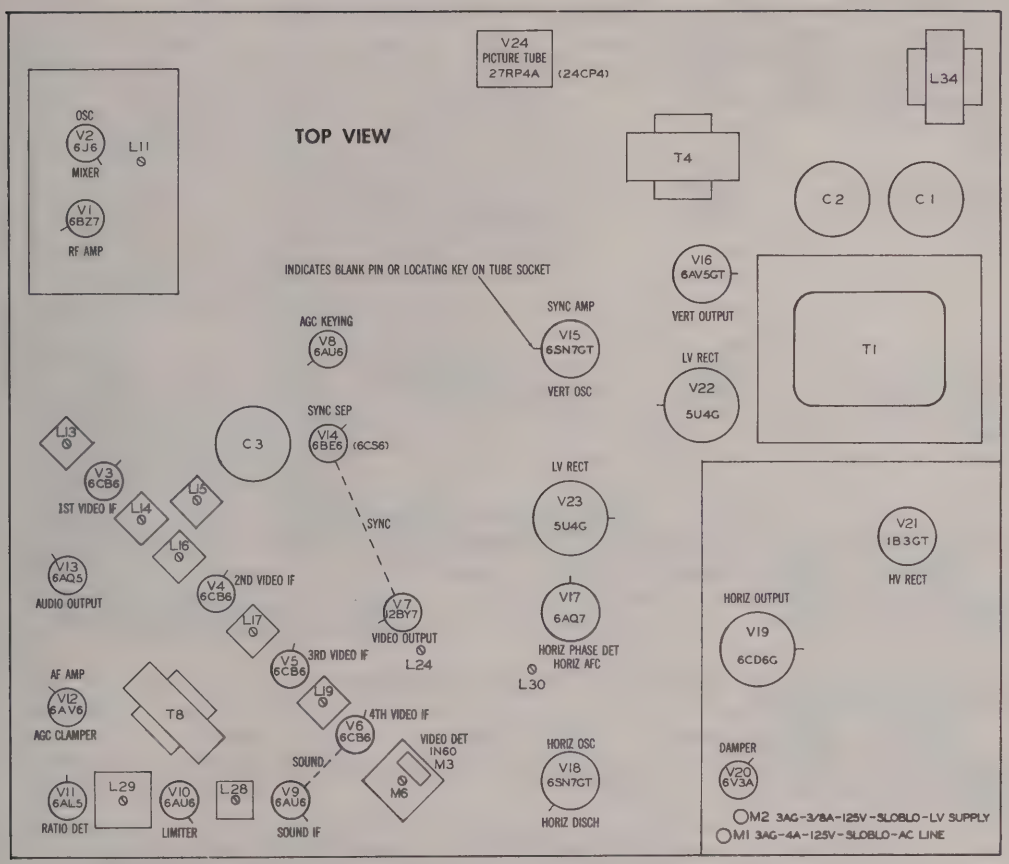
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, V23, Fuse (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V24
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8, V12

SYNC FAILURE
No vert. sync - V15
No horiz. sync - V15, V17, V18
No vert. or horiz. sync - V14, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V24
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22, V23
Vert. off freq. - V15
Horiz. off freq. - V15, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V18)

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications. In step 5 connect the negative lead of a 3 volt bias supply thru 1KΩ to the ungrounded side of C58. Connect the positive lead to chassis.
Use only enough sweep generator output for useable pattern on scope. If sweep generator has no built-in marker, couple a marker generator loosely to sweep generator output.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis.	44MC (10MC Swp)	41.75MC 45.75MC	Any	Vert. Amp. thru detector (Fig. I) to pin 5 Plate of 6CB6 (V3). Low side to chassis.	A1, A2	Connect a clip lead across terminals 1 and 3 of L15A and terminals 2 and 4 of L15B. Connect a .001MFD capacitor from pin 1 (grid) of 6CB6 (V3) to chassis. Adjust A1 and A2 for response curve similar to Fig. 2. Remove short from L15A and L15B.
2.	.001MFD	High side thru .001MFD capacitor to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	"	41.25MC 45.0MC 47.25MC	"	Vert. Amp. thru detector (Fig. I) to pin 5 (plate) of 6CB6 (V4). Low side to chassis.	A3, A4, A5, A6	Connect a clip lead from terminal #1 of L13 to chassis. Leave .001MFD capacitor from pin 1 of V5 to chassis connected as in step 1. Adjust A3 and A4 for response similar to Fig. 3. Adjust A5 (41.25MC) and A6 (47.25MC) to place markers in sound traps as in Fig. 3. If necessary, retouch A3 and A4 after adjusting trap positions. Remove clip lead from terminal #1 of L13. Remove .001MFD capacitor from pin 1 of V5 to chassis.
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis.	"	41.25MC 45.75MC 47.25MC	"	Vert. Amp. thru 3.3KΩ to point (A). Low side to chassis.	A7, A8, A9	Adjust for -3 volts bias at ungrounded side of C58. Adjust A7, A8 and A9 for response similar to Fig. 4. A7 affects the high frequency side of response curve. A8 affects the low frequency side. A9 affects overall tilt of top portion of response curve. Do not retouch adjustments A1 thru A6. If necessary, repeat steps 1, 2 and 3 until desired response is obtained. Replace original 6J6 in its socket.

4.5MC TRAP ALIGNMENT

Disconnect one side of 1N64 crystal at point (B). Do not overheat crystal with soldering iron. Set contrast control at maximum position.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4. 3.3KΩ ½ Watt Carbon Resistor	High side thru 3.3KΩ to point (D). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (Fig. I) to pin 11 (cathode) of picture tube. Common to chassis.	A10	Use high signal generator output. Turn A10 fully counter clockwise, then clockwise for MINIMUM deflection on VTVM. Reconnect 1N64 crystal at point (B).

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Disconnect one side of 1N64 crystal at point (B).

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5. 3.3KΩ ½ Watt Carbon Resistor	High side thru 3.3KΩ to point (B). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (C). Common to chassis	A11, A12	Adjust for MAXIMUM deflection.
6. "	"	"	"	DC probe to point (D). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Reconnect 1N64 crystal at point (B).

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Disconnect one side of 1N64 crystal at point (B).
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 130% sawtooth voltage in scope for horizontal deflection.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5. 3.3KΩ ½ watt carbon Resistor	High side thru 3.3KΩ to point (D). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (C). Low side to chassis.	A11, A12	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 5.
6. "	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A13	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines. Reconnect 1N64 crystal at point (B).

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C58 thru a 1KΩ resistor. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7. Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	199MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A14, A15, A16, A17	Adjust for response curve similar to Fig. 7. If unable to obtain the correct bandwidth by adjusting A14, A15 and A16 SLIGHTLY adjust A17 (wire gimmick). To increase bandwidth adjust A17 away from contacts. To decrease bandwidth adjust A17 closer to contacts.
8. "	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 7. If markers fall below 70% on any channel make compromise adjustments of A14, A15 and A16 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected. Do not readjust A17 on any channel except channel 10.
		207MC (10MC Swp)	205.25MC 209.75MC	12			
		201MC (10MC Swp)	199.25MC 203.75MC	11			
		189MC (10MC Swp)	187.25MC 191.75MC	9			
		183MC (10MC Swp)	181.25MC 185.75MC	8			
		177MC (10MC Swp)	175.25MC 179.75MC	7			
		81MC (10MC Swp)	83.25MC 87.75MC	6			
		79MC (10MC Swp)	77.25MC 81.75MC	5			
		69MC (10MC Swp)	71.25MC 75.75MC	4			
		63MC (10MC Swp)	61.25MC 65.75MC	3			
		57MC (10MC Swp)	55.25MC 59.75MC	2			

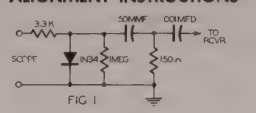


FIG 1

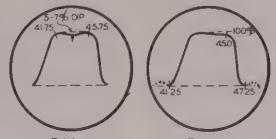


FIG.2

FIG.3

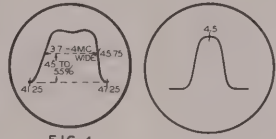


FIG.4

FIG.5

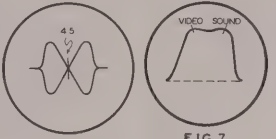


FIG.6

FIG.7

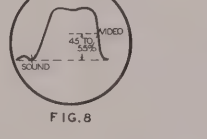


FIG.8

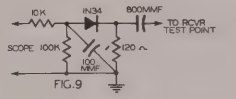


FIG.9

VHF OSCILLATOR ALIGNMENT

Leave bias connected as under "VHF RF and Mixer Alignment". Connect a jumper from the ungrounded side of C58 to the ungrounded side of C58.
The channel oscillator adjustment screws are reached through a hold just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9. Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 3.3KΩ to point (A). Low side to chassis.	A18	Advance scope gain so that the sound trap notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 45 to 55% response on opposite slope of response curve as in Fig. 8.
		207MC (10MC Swp)	205.25MC 209.75MC	12		A19	
		201MC (10MC Swp)	199.25MC 203.75MC	11		A20	
		195MC (10MC Swp)	193.25MC 197.75MC	10		A21	
		189MC (10MC Swp)	187.25MC 191.75MC	9		A22	
		183MC (10MC Swp)	181.25MC 185.75MC	8		A23	
		177MC (10MC Swp)	175.25MC 179.75MC	7		A24	
		85MC (10MC Swp)	83.25MC 87.75MC	6		A25	
		79MC (10MC Swp)	77.25MC 81.75MC	5		A26	
		69MC (10MC Swp)	67.25MC 71.75MC	4		A27	
		63MC (10MC Swp)	61.25MC 65.75MC	3		A28	
		57MC (10MC Swp)	55.25MC 59.75MC	2		A29	

IF TRAP ALIGNMENT

The IF trap, A30, is for the purpose of eliminating any IF interference from nearby transmitters operating in the 40 to 54MC band. If interference is noted, turn to channel 2 and adjust A30 to minimize it.

UHF IF STAGE ALIGNMENT

Switch channel selector to UHF position.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10. Direct	High side to pin 7 (grid) of UHF IF amplifier tube (6BZ7). Low side to chassis. Remove the side shield on tuner to connect sweep generator).	44MC (10MC Swp)	41.75MC 45.75MC	Any unused channel between 35 and 45	Vert. Amp. thru detector (Fig. I) to pin 5 (plate) of 6CB6 (V3). Low side to chassis.	A31, A32	Loosely couple marker generator to sweep generator output. Adjust A31 for response curve similar to Fig. 2. Check position of 41.75MC and 45.75MC markers. If markers do not fall on peaks of curve as in Fig. 2, adjust A32 (compress or expand coil turns) for correct marker positions. Compressing coil turns lowers the frequencies. Expanding turns increase frequency of the peaks. If A33 requires adjusting readjust A31 for equal peaks with correct marker positions.
11. Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	639MC (10MC Swp)	41.75MC 45.75MC	40	Vert. Amp. thru detector (Fig. I) to point (C). Low side to tuner chassis.	A33	Loosely couple marker generator to sweep generator output. Adjust A33 for maximum amplitude with equal peaks as in Fig. 2. Markers should appear on peaks of response curve.

UHF OSCILLATOR ALIGNMENT

When replacing the UHF oscillator tube (6T4) it may be necessary to try several tubes for one which gives the best performance. This portion of the receiver has been properly aligned at the factory. If it becomes necessary, proceed as follows:
Switch channel selector to UHF position.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12. 100 to 800MMF Capacitor	High side of UHF signal generator to diode crystal clip conc. section in the UHF tuner. Low side to chassis.	Not used	945MC (400^Mod)	UHF tuning shaft max. clockwise (high freq. end)	Vert. Amp. thru detector (Fig. I) to point (C). Low side to tuner chassis.	A34	Use low generator output. Adjust for MINIMUM 400^ indication on scope.
13. "	"	"	504MC (400^Mod)	UHF tuning shaft max counter clockwise (low freq. end)	"	A35	Use low generator output. Adjust for MINIMUM 400^ indication on scope. Repeat steps 12 and 13. If necessary replace oscillator tube (6T4) and repeat steps 12 and 13.

UHF RF AND MIXER ALIGNMENT

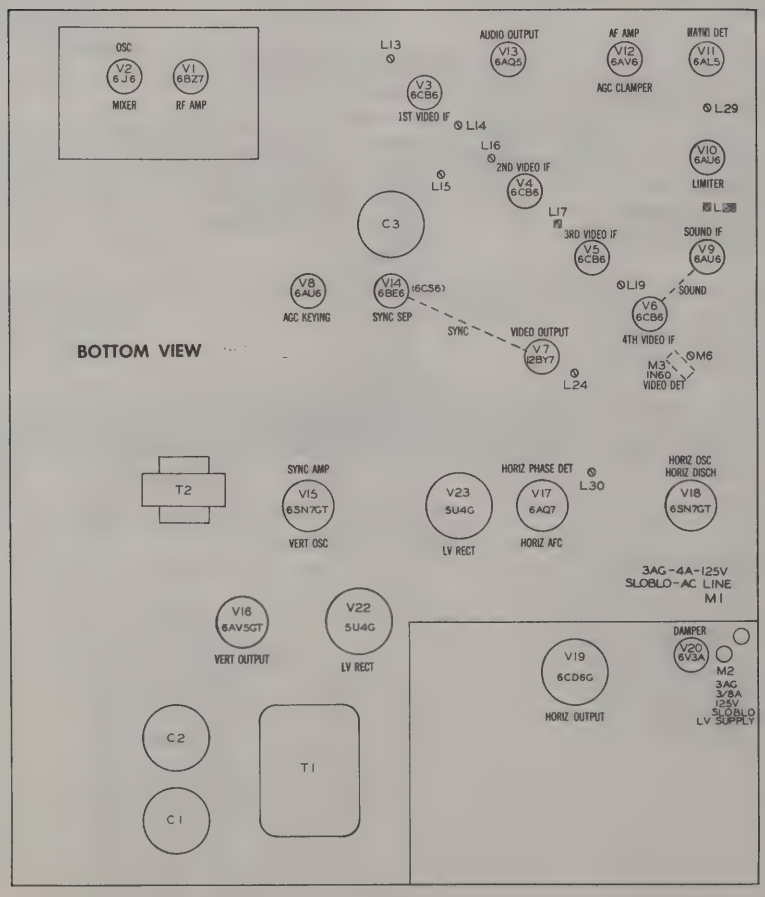
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

HALLICRAFTERS MODELS 24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D)

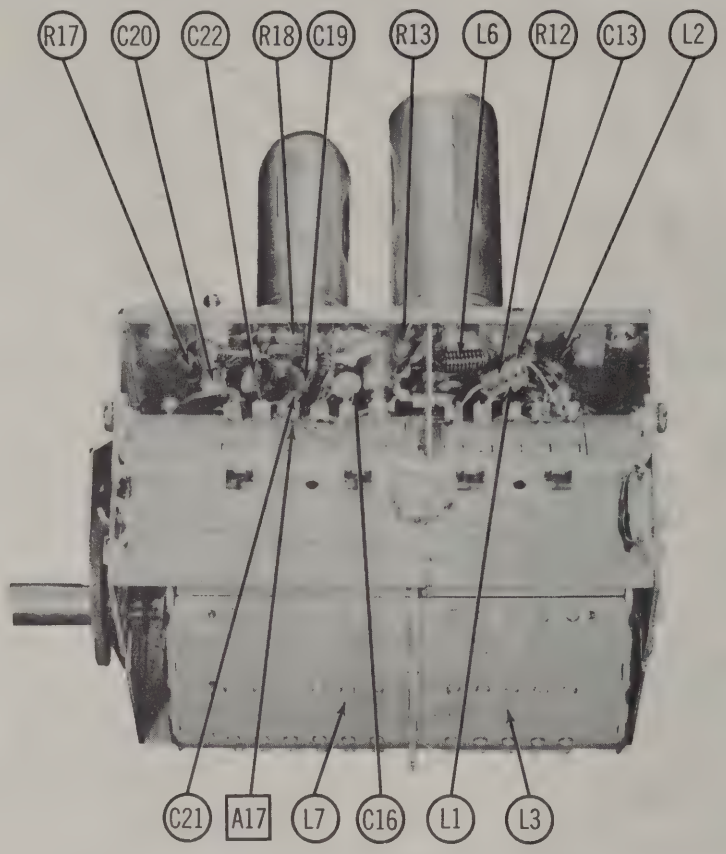
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	INF	850KΩ	0Ω	.1Ω	0Ω	†625Ω	140KΩ	INF	0Ω
V 2	6J6	†7KΩ	†17KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	60KΩ	47Ω	.1Ω	0Ω	†5KΩ	†3KΩ	0Ω		
V 4	6CB6	80KΩ	47Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 5	6CB6	50KΩ	47Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 6	6CB6	18KΩ	150Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 7	12BY7	0Ω	3.3KΩ	0Ω	0Ω	0Ω	.1Ω	†4.4KΩ	†9KΩ	0Ω
V 8	6AU6	†25KΩ	†10KΩ	INF	INF	440KΩ	†65Ω	†10KΩ		
V 9	6AU6	1Meg	0Ω	0Ω	.1Ω	†2.6KΩ	†100KΩ	0Ω		
V 10	6AU6	100KΩ	0Ω	0Ω	.1Ω	†47KΩ	†47KΩ	0Ω		
V 11	6AL5	10KΩ	10KΩ	.1Ω	0ΩL	1Meg	0Ω	1Meg		
V 12	6AV6	10Meg	0Ω	.1Ω	0Ω	850KΩ	850KΩ	†500KΩ		
V 13	6AQ5	470KΩ	330Ω	.1Ω	0Ω	†850Ω	†500Ω	470KΩ		
V 14	6BE6	40KΩ	0Ω	.1Ω	0Ω	†90KΩ	†30KΩ	1.5Meg		
V 15	6SN7GT	500KΩ	†7.5KΩ	2.2KΩ	1Meg	▲2.2Meg	0Ω	.1Ω	0Ω	
V 16	6AV5GT	1Meg	.1Ω	1KΩ	NC	†1KΩ	NC	0Ω	†11KΩ	
V 17	6AQ7	2Meg	1Meg	0Ω	3Meg	†47KΩ	470Ω	.1Ω	0Ω	
V 18	6SN7GT	47KΩ	†180KΩ	0Ω	32KΩ	†65Ω	10KΩ	.1Ω	0Ω	
V 19	6CD6G	NC	0Ω	215Ω	TP	680KΩ	NC	.1Ω	†8.5KΩ	TOP CAP ▲12Ω
V 20	6V3A	NC	†75Ω	NC	0Ω	.1Ω	NC	†75Ω	NC	†75Ω TOPCAP 600KΩ
V 21	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲400Ω
V 22	5U4G	NC	5KΩ	TP	16Ω	NC	17Ω	NC	5KΩ	
V 23	5U4G	NC	5KΩ	NC	16Ω	NC	17Ω	TP	5KΩ	
V 24	27RP4A	INF	†70KΩ	PIN 10 ▲470KΩ	PIN 11 †160KΩ	PIN 12 INF				

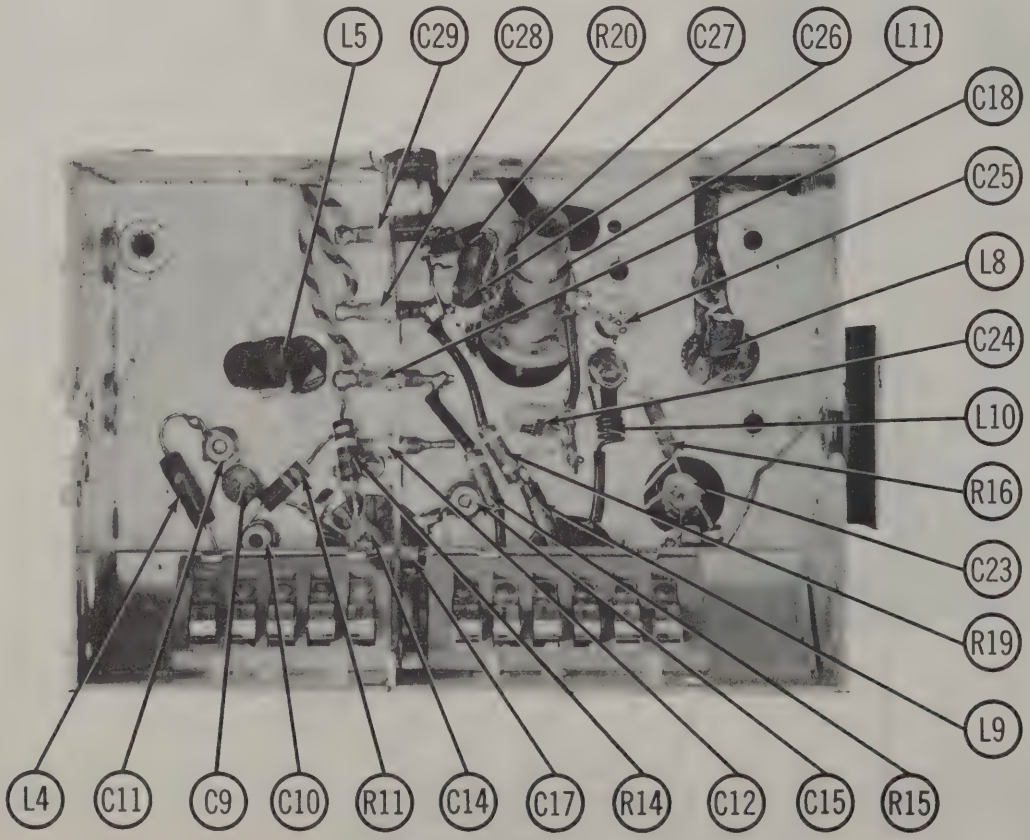
†MEASURED FROM PIN 8 OF V23.
▲MEASURED FROM TOP CAP OF V20.
NC-NO CONNECTION.
TP-TIE POINT.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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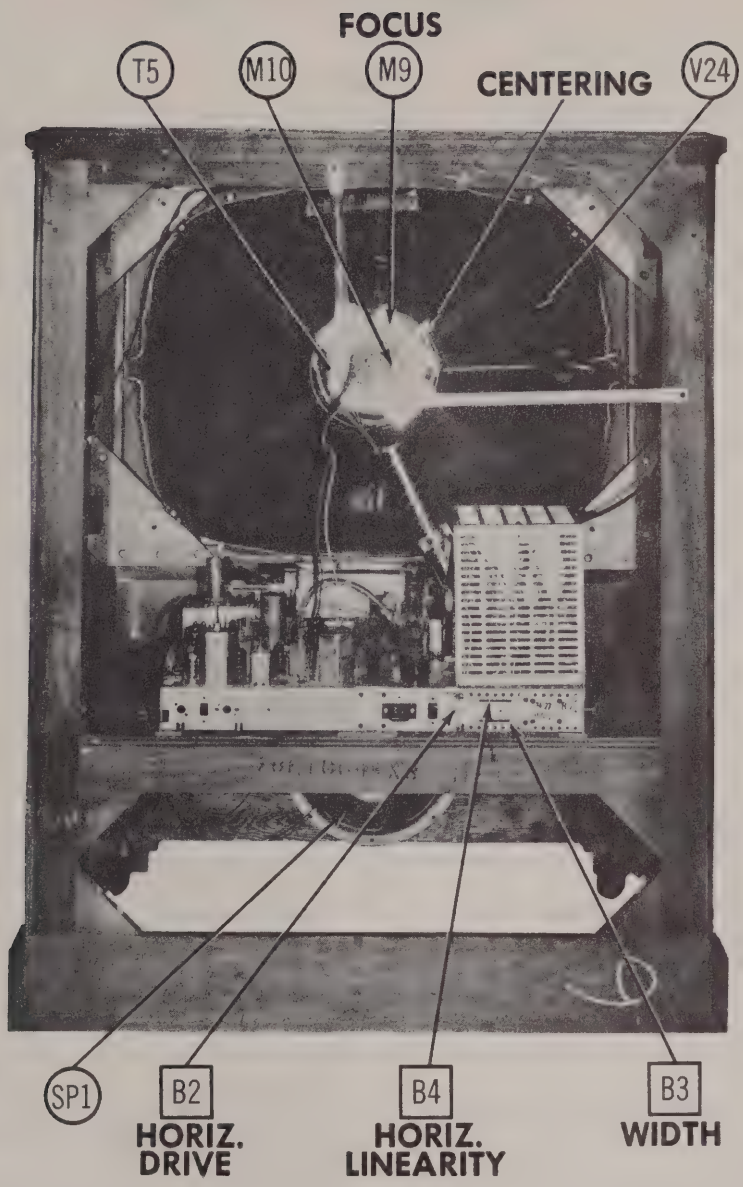

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in the strongest TV station in that area, preferably a test pattern.

Set the zero scale on center and connect the DC probe of a VTVM to point (F). Common to chassis.

Set the horizontal hold control to the center of its range and adjust the horizontal oscillator coil (B1) until the picture synchronizes horizontally. The VTVM should read a zero DC voltage, if necessary slightly readjust B1.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal drive trimmer (B2) as far clockwise as possible without the presence of vertical white lines or compression near the center of the picture.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V22 and V23. Check adjustments B2, B3 and B4. Check C99, C100, R121, R122, T3, T5A and other associated components.

DRIVE LINES

Check by substitution V19 and V20. Check adjustments B2 and B4. Check C99, C100, R121, R122, R124, R125, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17, V18, V19 and V20. Check C91 for open. Check C92, C93, C88, L30, R112 and other associated components.

XMAS TREE EFFECT

Check by substitution V17, V18, V19 and V20. Check T3 and T5 for internal arcing. Check L30, C89, C94, C96, C98, R126, R127, R110, R114 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R95, R101, C2B, C2C and other associated components.	Check T2, C82, C81, C80, R3, R99 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check height and vertical linearity controls for proper operation. Check R99, T4 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check C80, C82, T2, T4, R99, R3 and other associated components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check R2, R101, C20, C83, T4 and other associated components.

FOLDS

Check by substitution V15 and V16. Check T2, T4, T5B, C81, C82, C83, R101 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V14 and V15. Check C21, C74, C75, C6, R82, R83, R85 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V15. Check vertical integrator network. Check T2, R92, R4, C80, C79 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check R110, R112, R111, R5, C88, C93, C91, C95, C86, C87, L30 and other associated components.

HORIZONTAL BENDING

Check by substitution V14, V15, V17 and V18. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V7. Check R46, R47, R75, C53, L27 and other associated components.

SOUND BARS (4.5 MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A10. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check contrast control. Check L23, L25, C53, R46, R75 and other associated components.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check video crystal detector network. Check L23, L25, L26, C53, R46 and other associated components.

SMEAR

Substitute V7. Check L21, L22, L23, L25, L26, C53, and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11, V12 and V13. Check stages V12 and V13 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C68, C69, C70, C3C, C3D, R73, R74, R76, T8 speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A13 for minimum buzz. If still unsatisfactory check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound".

POWER

DEAD SET

If filaments fail to light check AC interlock assembly. Check fuse, M1. Check switch on volume control and T1. If filaments light. Check by substitution V22 and V23. Check fuse M2. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check by substitution V22 and V23. Check B+ filter and decoupling network.

PROPERTY OF
L. F. [illegible] NSHIP
[illegible] ST.
DENVER, COLORADO

HALLICRAFTERS MODELS 24K240B, M, 24K241B, M, 27K250B, M, 27K251B, M (Ch. C1400D, D1400D)

UHF-VHF TUNER SCHEMATIC

UHF TUNER PART NO. 1E1835 AND VHF TUNER PART NO. 1E1734 USED WITH CHASSIS C1400D

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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COMPARISON OF 1400D SERIES CHASSIS

The 1400D, Run 1 chassis may be considered the basic chassis in the 1400D Series. Run numbers shown below will indicate variations from this standard by one or more modifications.

CHASSIS	PICTURE TUBE SIZE & TYPE	VHF TUNER	UHF TUNER	RUN	MODIFICATIONS
C1400D	24" or 27" Glass	1E1734	1E1855	1	I, II, III, IV
				2	I, II, III, IV, V, VI
				3	I, II, III, IV, V, VI, VII
				3-1	I, II, III, IV, V, VI, VIII, IX, X, XI, XII
D1400D	24" or 27" Glass	1E1733	None	1	Basic 24"-27" Chassis IV
				2	IV, V, VI
				3	IV, V, VI, VII
				3-1	IV, V, VI, VII, IX, X, XI, XII

MODIFICATION I

LOCATION OF CHANGE	CHANGE MADE
A. Tuner	A. Tuner changed to part #1E1734.

MODIFICATION II

LOCATION OF CHANGE	CHANGE MADE
A. Tuner	A. UHF-VHF change-over switch added.

MODIFICATION III

LOCATION OF CHANGE	CHANGE MADE
A. Tuner	A. A continuous type UHF tuner (part #1E1855) added.

MODIFICATION IV

LOCATION OF CHANGE	CHANGE MADE
A. Audio output screen (pin 6 of V13).	A. The value of C3C is increased from 20MFD to 60MFD by adding a 40MFD, 450V. electrolytic in parallel with C3C.
B. Audio output cathode (pin 2 of V13).	B. R76 is increased from 270Ω to 330Ω.
C. Audio output screen (pin 6 of V13).	C. R74 is increased from 390Ω to 560Ω.
D. Audio output plate (pin 5 of V13).	D. C70 is changed from a .01MFD, 500V. ceramic disc to a .01MFD, 1000V. molded tubular.
E. Pins 5 and 6 of V12.	E. C58 is increased from .1MFD, 200V to .5MFD, 25V.
F. Pins 5 and 6 of V12.	F. R72 which connected to pin 6 of V13 is now connected to the junction of R74 and R75.

MODIFICATION V

LOCATION OF CHANGE	CHANGE MADE
A. Horizontal AFC and oscillator.	A. V17 and V18 are shock mounted.

MODIFICATION VI

LOCATION OF CHANGE	CHANGE MADE
A. In series with height control (R3).	A. A 1Meg, 1 watt resistor is added in series with the high side of R3 and the junction of C80 and C81.

MODIFICATION VII

LOCATION OF CHANGE	CHANGE MADE
A. AGC network (pins 5 and 6 of V12).	A. R61 is increased from 560KΩ to 680KΩ.
B. 1st. and 2nd. Video IF amplifiers .	B. V3 and V4 changed to 6CF6 tubes.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Osc.-Mixer	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	Keyed AGC	6AU6	6AU6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Limiter	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amp.-AGC Clamper	6AV6	6AV6	7BT	
V13	Audio Output	6AQ5	6AQ5	7BZ	
V14	Sync Separator	6BE6	6BE6	7CH	6CS6 used as an alternate
V15	Sync Amp.-Vert. Osc.	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6AV5GT	6AV5GT	6CK	
V17	Horiz. Phase Det.-Horiz. AFC	6AQ7	6AQ7	8CK	
V18	Horiz. Osc.-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6CD6G	6CD6G	5BT	
V20	Damper	6V3A	6V3A	9BD	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	Hallicrafters PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V24	27RP4A ①	27RP4 ①	27RP4 ①	27RP4 ② 27EP4 ②③	27RP4 ①	12N 12N	① Aluminized ② Silver screen ③ Circuit changes necessary
	24CP4	24TP4/24CP4A ①	24CP4	24CP4 24CP4A ②	24CP4	12N 12N	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	Hallicrafters PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲40	400	45C242		TM-8040-450	T-170	
B	▲80	400					
C2A	▲40	400	45A237		TM-3057	T-720	
B	■40	400			TD-80-250	FM-25100	
C	▲80	250					
D	80	50					
C3A	■10	350	45C238	FP333.8	TM-3127	T-815	
B	▲80	300		TC26	TD-25-25	MT-4580	
C	▲20	400					
D	20	25					
C4	5	50	45B175	TC30	TD-5-50	MMT-0505	
C5	1	50	45C163	TC31	TD-1-50	MMT-0505	
C6	4	300	45B241	TC60	TD-4-450	FM-4504	
C7	8	475	45A103	TC82	TD-8-475	MT-4710	
C8	5	50	45B175	TC30	TD-5-50	MMT-0505	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	Hallicrafters PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C9	3		121A167	TCZ-3R3	NP0A-030	ZT-5533	
C10	3-9		121A063	829-10			
C11	3-9		121A063	829-10			
C12	800		121A048				
C13	3		121A157	TCZ-3R3	NP0A-030	ZT-5533	
C14	1000		121A159	DD-102	801-001	DC-521	
C15	.5-3		121A158	829-3	3115-01-0R5	CT565A	
C16	120		121A164	DD-121	811-121	UC-5312	
C17	800		121A156				
C18	800		121A048				
C19	47		121A161	DD-470	831-470	UC-5447	
C20	.5-3		121A158	829-3	3115-01-0R5	CT565A	
C21	10		121A162	TCZ-10	NP0K-100	ZT-541	
C22	5		121A160				
C23	1000		121A159	DD-102	801-001	DC-521	
C24	1000		121A159	DD-102	801-001	DC-521	
C25	6.8		121A163	TCZ-6R8	NP0A-6R8	ZT-5568	
C26	47		121A231	TCZ-47	NP0-338-470	ZT-5447	
C27	1000		121A159	DD-102	801-001	DC-521	
C28	800		121A048				
C29	800		121A048				
C30	1000		47A230	DD-102	801-001	DC-521	
C31	820		47A320	D6-821	GP2L-821	DC-521	
C32	1000		47A230	DD-102	801-001	DC-521	
C33	680		47A319	D6-681	GP2K-681	UC-5368	
C34	1000		47A230	DD-102	801-001	DC-521	
C35	7		47X20UJ070C/D				
C36	6		47X20UJ060C/D				
C37	1000		47A230	DD-102	801-001	DC-521	
C38	820		47A320	D6-821	GP2K-820	DC-521	
C39	1000		47A230	DD-102	801-001	DC-521	
C40	24		47CA20A240J	TCZ-24	NP0L-240		
C41	1000		47A230	DD-102	801-001	DC-521	
C42	820		47A320	D6-821	GP2K-821	DC-521	
C43	1000		47A230	DD-102	801-001	DC-521	

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No	CENTRALAB PART No	ERIE PART No	MALLORY PART No	NOTES
C44	1000		47A320	DD-102	801-001	DC-521	
C45	34		47CA30A340J	TCZ-34	MPOL-340		Note 1
C46	680		47A315	DS-681	811-681	UC-5386	Note 1
C47	5000		47A168	DD-502	811-001	DC-525	
C48	1000		47A320	DD-102	801-001	DC-521	
C49	1000		47A320	DD-102	801-001	DC-521	
C50	68		47TX07T680K				Note 1
C51	39		47CA39A390K	TCZ-39	MPOL-390		Note 1
C52	15		47CA35A150K	TCZ-15	MPOL-150		Note 1
C53	.1	400	46BS104L4	DF-104		PT401	
C54	.005	600	46AY502	DS-502	GP3-333-502	PT835	
C55	.1	400	46AY104J	DF-104		PT401	
C56	1000		47A320	DD-102	801-001	DC-521	
C57	.1	300	46AU104J	DF-104		PT401	
C58	.1	300	46AU104J	DF-104		PT401	
C59	4.7		TCZ-4R7	NPOA-4R7		ZT-5547	
C60	5000		47A168	DD-502	811-001	DC-525	
C61	5000		47A168	DD-502	811-001	DC-525	
C62	1000		47A320	DD-102	801-001	DC-521	
C63	47		47CA33A470K	TCZ-47	MPO-338-470	ZT-5547	Note 1
C64	5000		47A168	DD-502	811-001	DC-525	
C65	330		47CA35A331K	DS-331	GP2E-331	UC-5333	
C66	2000		47A198	DD-202	801-001	DC-522	
C67	10000		47A324	DD-103	811-01	DC-511	
C68A	10000						
B	250		†48A617	†PC-80	†14044-01		
C							
C69	.05	600	46A7503J	DF-503		PT815	
C70	.01	1000	46BR103L10	DD-103		PT816	
C71	.05	400	46AW503J	DF-503		PT415	
C72	1000		47A320	DD-102	801-001	DC-521	
C73	.25	400	46AW254J			PT4025	
C74	.047	400	46BS473L4	DF-503		PT1417	
C75	.0022	400	46BR222L4	D6-222	GP3-333-222	PT8232	
C76	.0047	400	46BR472L4	D6-472	GP3-333-472	PT8247	
C77	.0047	400	46BR472L4	D6-472	GP3-333-472	PT8247	
C78	.0068	600	46BS682L6	D6-682	GP3-333-682	PT8268	
C79	470	500	47X309471K	DJ-471	811-471	MC1245	
C80	.1	400	46BS104L4	DF-104		PT401	
C81	.1	400	46AY104J	DF-104		PT401	
C82	5000		47A168	DD-502	811-001	DC-525	
C83	.01	1000	46BS103L10	DD-103		PT816	
C84	.01	600	46A7503J	DF-503	GP3-333-103	PT815	
C85	180	500	47X20B181K	D6-181	811-181	MC8537	
C86	56	500	47X20D560K	TCZ-56	MPO-337-560		Note 1
C87	75	500	47X20D750K	TCZ-75	MPO-337-750	MC8230	Note 1
C88	.001	600	46BS102L6	D6-102	801-001	PT831	
C89	.0012	600	46BR122S6				Note 1
C90	1000	500	47X30B103K	D6-103	GP2L-103	MC355	
C91	.15	200	46A7154J	DF-304		PT4015	
C92	200	200	46A7104J			PT401	
C93	680	500	47X30D681K	TCZ-230	MPO-333-231		Note 1
C94	220	500	47X30D221K				Note 1
C95	1500	500	47X30B152K			MC8456	
C96	1100	500	47X30G11BK				Note 1
C97	600	600	46BS109L6	D6-109	GP2L-103	PT831	
C98	680	500	47X20D681K				Note 1
C99	180	500	47X20B181K	TCZ-180	MPO-334-181		Note 1, 3
C100	.1	400	46BS104L4	DF-104		PT401	
C101	.047	600	46BS473L6	DF-503		PT8247	
C102	.047	600	46BS473L6	DF-503		PT8247	
C103	.001	1000	46BR102L10	DD-103	BR5KV-102	PT1521	
C104	120	3000	47A396	DD30-121			Note 1
C105	.47	200	46BS474L3			PT4047	
C106	500	30000	47A314		416		
C107	80						
C108	80						
C109	.01	600	46BR103L6			PT831	Note 1
C110	.01	600	46BR103L6			PT831	Note 1

Note 1. Mfgr recommends exact replacement part only.
Note 2. Some versions use 150MMF in this application (part #47X301S1K).
† Items C68A, C68B, C68C, R73A and R73B are combined in one unit.
When replacing items separately, C68B and C68C should total 250MMF.

CONTROLS

ITEM No	RATING RESIS ANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	50KΩ	½	25C1057	QJ-788A	R7Y-536	F1-29	UP54L	Brightness (Panel)
B	1Meg	½				R2-53	UR16A	Volume (Rear)
C	Switch	½				KD-5	US-37	Attach to R1B
R2A	750Ω	½	25C106L	Qil-105	A47-750-S	AB-5	U-6	Vertical Linearity
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A.
R3A	4.6Meg	½	25C105I	Qil-141#	A47-4Meg-S	AB-56	U-67#	Height (Stop at 4 Meg)
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A.
R4A	1.5Meg	½	25C105G	Qil-137†	A47-1Meg#†	AB-59†	U-54†	Vertical Hold (Stop at 1Meg)
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A.
R5A	100KΩ	½	25C104S	Qil-128	A47-100K-S	AB-40	U-41	Horisontal Hold
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R5A.
R6	500Ω	2	25A1074					Dial Light Dimmer (Wire Wound)
R7A	10KΩ	2	25B1049	Qil-118	A47-10K-S	AB-14		U-20
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4		Attach to R7A.
R8A	10KΩ	½	25B1045	Q17-131K#		ABT-154		Contrast (Taps at 5KΩ and 10KΩ)
B	Shaft	½	Not Req.	Not Req.		AK-3		Attach to R8A.
R9A	750KΩ	½	25C105S	Qil-115	A47-750-D	AB-13		AGC
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4		Attach to R9A.
R10A	2Meg	½	25C105J	Qil-139	A47-2Meg-S	AB-75		Picture Guard
B	Shaft	½	Not Req.	Not Req.	KS8-3	AK-4		Attach to R10A.

* Connect a 600KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
† Connect a 500KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
# Universal replacement (Mallory Exact Duplicate Part No. UE1045).
▲ CONCENTRIKIT EQUIVALENT; K-6 KIT, BASE ELEMENTS AND SHAFTS; B11-123, P13-113 (Panel)
B13-137, R17-203 (Rear)
76-2 Switch

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Hallicrafters PART No.	IRC PART No.	NOTES
R11	47KΩ	½	25X30X473K	BTS-47K	
R12	15KΩ	½	25X30X153K		
R13	330KΩ	½	25X70X334K		
R14	220KΩ	½	25X30X224K		
R15	470Ω	½	25X30X471K	BTS-470	
R16	220KΩ	½	25X20X224K		
R17	10KΩ	½	25X30X103K		
R18	10KΩ	½	25X30X103K		
R19	4700Ω	½	25X30X471K		
R20	15KΩ	½	25X30X153K		
R21	100Ω	½	25X30X101K	BTS-100	
R22	100Ω	½	25X30X101K	BTS-100	
R23	3300Ω	½	25X30X333K		
R24	1000Ω	½	25X30X102K	BTS-1000	
R25	2200Ω	½	25X30X222K	BTS-2200	
R26	27KΩ	½	25X30X273K		
R27	10KΩ	½	25X30X103K	BTS-1000	
R28	100Ω	½	25X30X101K	BTS-100	
R29	47Ω	½	25X30X470K	BTS-47	
R30	27Ω	½	25X30X270K	BTS-27	
R31	22KΩ	½	25X30X223K		
R32	33KΩ	½	25X30X333K		
R33	22KΩ	½	25X30X223K		
R34	1000Ω	½	25X30X102K	BTS-1000	
R35	47Ω	½	25X30X470K	BTS-47	
R36	100Ω	½	25X30X101K	BTS-100	
R37	1MΩ	½	25X30X105K		
R38	1000Ω	½	25X30X102K	BTS-1000	
R39	100Ω	½	25X30X101K	BTS-100	
R40	47Ω	½	25X30X470K	BTS-47	
R41	18KΩ	½	25X30X183K		
R42	1000Ω	½	25X30X102K	BTS-1000	
R43	100Ω	½	25X30X101K	BTS-100	
R44	150Ω	½	25X30X151K	BTS-150	
R45	3300Ω	½	25X30X332K	BTS-3300	
R48	50000Ω 5%	10	24BG502D	1 3/4 A-5000 5%	Note 2
R47	2200Ω	½	25X30X222K	BTS-2200	
R48	33KΩ	½			Note 3
R49	680Ω	½	25X30X681K	BTS-680	
R50	220KΩ	½	25X30X224K		
R51	33KΩ	½	25X30X333K		
R52	33KΩ	½	25X30X333K		
R53	470KΩ	½	25X30X474K		
R54	470KΩ	½	25X30X474K		
R55	47KΩ	½	25X30X473K		
R56	15KΩ	3	25X40X153K	BTS-15K	
R57	10KΩ	3	25X40X103K	BTA-10K	
R58	33KΩ	½	25X30X333K		
R59	56KΩ 5%	1	25X30X563J		Note 2
R60	330KΩ	½	25X30X334K		Note 2
R61	560KΩ 5%	½	25X30X564J		Note 2
R62	1Meg	½	25X30X105K	BTS-1Meg	
R63	100KΩ	½	25X30X104K	BTS-100K	
R64	2200Ω	½	25X30X222K	BTS-2200	
R65	100KΩ	½	25X30X104K	BTS-100K	
R66	47KΩ	½	25X20X473K	BTS-47K	
R67	270Ω	½	25X30X271K	BTS-270	
R68	33KΩ	½	25X30X333K	BTS-33K	
R69	10KΩ 5%	3	25X20X103J	BTS-10K 5%	Note 2
R70	10KΩ 5%	½	25X30X103J	BTS-10K 5%	Note 2
R71	10Meg	½	25X30X106K	BTS-10Meg	
R72	5.1Meg 5%	½	25X30X515J	BTS-5.1Meg 5%	Note 2
R73A	500KΩ	½	‡48A617	BTS-470K	
B	500KΩ	½		BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Hallicrafters PART No.	IRC PART No.	NOTES
R74	390Ω	3	25X40X390K	BTB-390	
R75	15KΩ	3	25X40X153K	BTB-15K	
R76	330Ω	1	25X30X331K	BTA-330	
R77	33KΩ	1	25X30X333K		
R78	470KΩ	1	25X30X474K		
R79	10KΩ	1	25X30X103K		
R80	4.6Meg	1	25X30X465K		
R81	100KΩ	1	25X30X104K		
R82	330KΩ	1	25X30X334K		
R83	37KΩ	1	25X30X373K		
R84	470KΩ	1	25X30X474K		
R85	10KΩ	1	25X30X103K		
R86	330KΩ	1	25X30X332K		
R87	33000Ω	1	25X30X332K		
R88	33000Ω	1	25X30X332K		
R89	33KΩ	1	25X30X333K		
R90	33000Ω	1	25X30X332K		
R91	8300Ω	1	25X30X822K		
R92	6800Ω	1	25X30X684K		
R93	1Meg	1	25X30X105K		
R94	16KΩ	3	25X40X163K		
R95	270Ω	1	25X30X271K		
R96	47KΩ	3	25X40X473K		
R97	47KΩ	3	25X40X473K		
R98	470KΩ	1	25X30X474K		
R99	150KΩ	1	25X30X154K		
R100	470KΩ	1	25X30X474K		
R101	470Ω	1	25X30X471K		
R102	560Ω	1			
R103	560Ω	1			
R104	68KΩ	1	25X30X683K		
R105	1Meg	1	25X30X105K		
R106	1Meg	1	25X30X105K		
R107	100Ω	1	25X30X101K		
R108	470KΩ	1	25X30X474K		
R109	1Meg	1	25X30X105K		
R110	47KΩ	1	25X30X473K		
R111	100KΩ	1	25X30X104K		
R112	470Ω	1	25X30X471K		
R113	22KΩ	1	25X30X223K		
R114	10KΩ	2	25X40X103K		
R115	47KΩ	1	25X30X473K		
R116	180KΩ	1	25X30X184K		
R117	18KΩ	1	25X30X183K		
R118	680KΩ	1	25X30X684K		
R119	100Ω	2	25X40X101K		
R120	47Ω	2	25X40X470K		
R121	15KΩ	2	25X40X153K		
R122	18KΩ	2	25X40X183K		
R123	1500 5%	1		1 3/4A-150 5%	Note 1
R124	68Ω	1		BTA-68	Note 1
R125	68Ω	1		BTA-68	Note 1
R126	68KΩ	1	25X30X683K		
R127	68KΩ	1	25X30X683K		
R128	330Ω	2	25X30X330K		
R129	2.9Ω	2	25X20X29K	BW½-2.9	
R130	1Meg	1	25X30X105K	BTA-1Meg	
R131	5.6Ω	5			
R132	1800Ω	15	24BP7T		Note 2
R133	150KΩ	5	25X30X254K	BTS-150K	
R134	10K	10	24BG105E	PW10-10K	
R135	270KΩ	1	25X30X274K	BTS-270K	

Note 1. In some versions, R123 is 180Ω 5W 5%WW resistor.
When R123 is 180Ω, R124 & R125 are omitted.
Note 2. Mfgr. states to use exact replacement only.
Note 3. Not used in some versions.
* Items C68A, C68B, C68C, R73A, R73B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Hallicrafters PART No.	Halldorson PART No	Merit PART No	RCA TYPE No.	Stancor PART No.	Thordorson PART No.	Triad PART No
T1	117VAC @ 2.4A	560VCT @ .380ADC	5VAC @ 6A	52D287 ① 53C287 ①				P-8161 ②	26R34	
		SEC. 3	SEC. 4	SEC. 5						
		6.3VAC @ .9A	6.3VAC @ 2.8A							

① Alternate power trans.
② Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Hallicrafters PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Osc. Trans.	55D221	B6700	A-3000	209T1	V40S	A-8111	24A87	A-95X
T3	Horiz. Output Trans.	55D216	FB419 & RF800*	HVO-36*	235T1 & 216R1*	XO94*	A-8253* ②	FLY-16 & WC-20*	D-50 & WC-19
T4	Vert. Output Trans.	55C218	21804 ①	A-3037 ①	222T1 ①	V313 ②	A-8123 ②	26S52 ①	A-102X ①
		55A217 ② ①	DF608 ②	MDF-91 ④	237D1 ④		DY-15A ②	Y-14 ④	Y-40-1 ③
T5A	Yoke (90°) Horiz. (12MM	55D31D31 ①							
B	Vert. (42MM)								
T6	Horiz. Lin. Coil (L 4-7. 2MH)	51A147D	RF800 ⑤	MWC-11 ⑤	213R1 ⑤	20UR15 ⑤	WC-8 ⑤	WC-22 ⑤	WC-12 ⑤ ⑥
T7	Width Coil (3. 2-4. 2MH	51B1673	RF800 ⑤	MWC-11 ⑤	212R1 ⑤	20UR3A ⑤	WC-8 ⑤	WC-18 ⑤	WC-11 ⑤ ⑦

① Alternate Hallicrafter part number.
② Drill new mounting hole(s).
③ Includes capacitors C107 & C108, resistors R102 & R103, R131.
④ Connect horizontal damping network across terminals #3 & #7, use original network, if necessary.
⑤ Drill new mounting hole, use original slider & core.
⑥ Connect to terminals #3 & #4.
⑦ Connect to coded red & blue terminals.
⑧ Do not use tap.
⑨ Connect to loose terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
9	9	9	9	9	8	9	9
8	7	7	7	7	1	7	7
5	7	7	7	7	7	7	7
7	T	T	T	T	3	3	T
4	3	3	3	3	3	3	3
7	T	1	1	1	4	1	1
1	Term #3 of RF800	2	Term "C" of 216R1	6	6	Term #1 of WC-20	Orange Term of WC-11
	Term #4 of RF800		Term "D" of 216R1			Term #2 of WC-20	Black Term of WC-11
3	Term #8	8	Term #7	2	7	Term #3	Red & Blue #4 of WC-20
Connect Width Coil Across	1 & 3	Terms #1&#2 of RF800 across 2 & 1	2 & 8	5 & 7	5 & 2	Terms #3 & #4 of WC-20 across 2 & 1	Terms of WC-11 across 2 & 1
Special Notes	⑩ ⑪	⑩ ⑪	⑩ ⑪	⑫	⑬	⑩ ⑪	⑩ ⑪

⑩ Remove capacitors C104, C105, & resistor R118 from circuit.
⑪ If the picture is out of phase, reverse width coil primary or secondary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Hallicrafters PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordorson PART No	Triad PART No	NOTES
T8	5.6KΩ	2.5Ω	55C222 ① 55B222 ②	21D03	A-8019	A-3877 ①	26S49	S-5Z	① Drill one new mounting hole. ② Alternate audio output.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	REPLACEMENT DATA Hallicrafters PART No	QUAM PART No	NOTES
SP1	10"	PM	3.5Ω	53D152	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω		121A153				Wound on 68MMF cap.
L2	IF Trap	0Ω		121A154				Wound on 68MMF cap.
L2A	Ant. Coil	0Ω CT	0Ω	121A176				Channel 2
B	Ant. Coil	0Ω CT	0Ω	121A177				Channel 3
C	Ant. Coil	0Ω CT	0Ω	121A178				Channel 4
D	Ant. Coil	0Ω CT	0Ω	121A179				Channel 5
E	Ant. Coil	0Ω CT	0Ω	121A180				Channel 6
F	Ant. Coil	0Ω CT	0Ω	121A181				Channel 7
G	Ant. Coil	0Ω CT	0Ω	121A182				Channel 8
H	Ant. Coil	0Ω CT	0Ω	121A183				Channel 9
I	Ant. Coil	0Ω CT	0Ω	121A184				Channel 10
J	Ant. Coil	0Ω CT	0Ω	121A185				Channel 11
K	Ant. Coil	0Ω CT	0Ω	121A186				Channel 12
L	Ant. Coil	0Ω CT	0Ω	121A187				Channel 13
L4	IF Trap	.1Ω		121A155				
L5	Fil. Choke	0Ω		121A049				
L6	Neut. Coil	0Ω		121A050				
L7A	RF, Mixer Grid & Coils	0Ω		121A188				Channel 2
B	RF, Mixer Grid & Coils	0Ω		121A189				Channel 3
C	RF, Mixer Grid & Coils	0Ω		121A190				Channel 4
D	RF, Mixer Grid & Coils	0Ω		121A191				Channel 5
E	RF, Mixer Grid & Coils	0Ω		121A192				Channel 6
F	RF, Mixer Grid & Coils	0Ω		121A193				Channel 7
G	RF, Mixer Grid & Coils	0Ω		121A194				Channel 8
H	RF, Mixer Grid & Coils	0Ω		121A195				Channel 9
I	RF, Mixer Grid & Coils	0Ω		121A196				Channel 10
J	RF, Mixer Grid & Coils	0Ω		121A197				Channel 11
K	RF, Mixer Grid & Coils	0Ω		121A198				Channel 12
L	RF, Mixer Grid & Coils	0Ω		121A199				Channel 13
L8	Fil. Choke	0Ω		121A051				
L9	Feedback Coil	1.5Ω		121A152				
L10	RF Coil	0Ω		121A151				
L11	Conv. Plate	0Ω		121A150				
L12	RF Coil	4.3Ω		53A307	18-1006			18 Microhenries
L13	Ist. Video IF Grid	.1Ω		50C604	17-5001 *	TV-128 *		6233*
L14	Ist. Video IF Plate	.1Ω		50C610	17-5001 ●	TV-128 ●		6231 ●
L15A	41.25MC Trap	0Ω		50C605				
B	47.25MC Trap	0Ω						
L16	2nd. Video IF	.1Ω		50C609	17-5001 ●	TV-128 ●		6231 ●

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L17	3rd. Video IF	.1Ω		50C606	17-5001 ■	TV-125 ■	6231 ■	
L18	Fil. Choke	0Ω		53A282	19-3001		6175	.4 Microhenry
L19	4th. Video IF	.1Ω		50C607	17-5004 ■	TV-125 ■	6234 ■	
L20	Fil. Choke	0Ω		53A282	19-3001		6175	.4 Microhenry
L21	Series Peaking Coil	4.2Ω		53A307	19-1006		4624	16 Microhenries
L22	Shunt Peaking Coil	4.4Ω		51B1740	19-3300 ▲		6155 ▲	280 Microhenries, wound on 15KΩ resistor
L23	Series Peaking Coil	3.9Ω		51B1741	19-3093 ♦	TV-181 ♦	6177 ♦	90 Microhenries, wound on 10KΩ resistor
L24	4.5MC Trap	1Ω		51B1542	20-1004	TV-151	1469	
L25	Shunt Peaking Coil	11Ω		51B1821	19-3500 ▲		6174 ▲	495 Microhenries, wound on 1KΩ resistor
L26	Series Peaking Coil	5Ω		51B1739	19-3125 †		6153 †	126 Microhenries, wound on 12KΩ resistor
L27	Series Peaking Coil	4.2Ω		53A307	19-1006		4624	16 Microhenries
L28	Sound IF	1.5Ω		51B1715	17-3495 ■	TV-113 ■	1470-A #	
L29	Ratio Det.	3.9Ω	.6ΩCT	50C473	17-1033	TV-110	1468	Tertiary winding-.4Ω
L30	Horiz. Osc.	85Ω		51B1716	19-1577		6324	Tapped ⓐ 42Ω
L31	RF Choke	4.2Ω		53A307	19-1006		4624	16 Microhenries
L32	RF Choke	4.2Ω		53A307	19-1006		4624	16 Microhenries
L33	Spook Coil	11Ω		53B283				Wound on .22MFD cap.

* Use adaptor plate, detune trap and use one winding only.
■ Use adaptor plate and use one winding.
▲ Parallel with 15KΩ resistor.
♦ Parallel with 10KΩ resistor.
▲ Parallel with 1KΩ resistor.
† Parallel with 12KΩ resistor.
# Use adaptor plate.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA Hallicrafters PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L34	.280ADC	56Ω	1.1HY	56A164 56B164 ①	C5037 ②	C-2996 ②	C-2326 ②	26C44 ②	C-17X ②

① Alternate filter choke.
② Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Hallicrafters PART No. FUSE	Hallicrafters PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG P/T S/B	4A 125V	FS-301		315004 (3AG P/T S/B 4A.)		MDV4	
M2	3AG P/T S/B	3/8A 125V	FS-302		315.375 (3AG P/T S/B 3/8A)		MDV 3/8	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M3	1N60 *		1N60	Video detector

* Some versions may use type 1N64 crystal diode in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M4	Dial Light	39A043	
M5	Tuner	1E1733	VHF - Ch. D1400D
	Tuner	1E1734	VHF - Ch. C1400D
M6	Tuner	1E1855	UHF - Ch. C1400D
M7	Video Det. Assy.	50C608	Includes M3, coils and capacitor
M8	Switch	60C601	VHF-UHF - Ch. C1400D
M9	Focus Magnet	21C164	Includes centering device
M10	Ion Trap	21A151	
B2	Trimmer Cap.	44A361	Horiz. Drive (80-350MMF)
	Pointer	82A245	VHF
	Pointer	82A244	UHF
	Dial Scale	83C447	VHF
	Dial Scale	83C448	UHF

COMPARISON OF 1400D SERIES CHASSIS (CONT.)

MODIFICATION VIII

LOCATION OF CHANGE	CHANGE MADE
A. 260V lead into tuner. B. AGC network (pins 5 and 6 of V12). C. Keyed AGC cathode (pin 7 of V8).	A. A 3900Ω, 2 watt resistor added in the 260V line feeding the tuner. B. R61 is replaced by a 270KΩ and a 330KΩ connected in series. C. The .1MFD capacitor connected from pin 7 of V8 to ground is deleted.

MODIFICATION IX

LOCATION OF CHANGE	CHANGE MADE
A. Grid of 3rd. Video IF (pin 1 of V5). B. Grid of 4th. Video IF (pin 1 of V6). C. Cathode of 4th. Video IF (pin 2 of V6). D. Pin 6 of V6. E. Video detector assembly (M7). F. Video detector assembly (M7). G. Terminal A of M7. H. Video output cathode (pin 1 of V7).	A. R37 is increased from 18KΩ to 27KΩ. B. R41 is increased from 15KΩ to 18KΩ. C. C47 is decreased from 5000MMF to 1000MMF. D. C46 is increased from 680MMF to 1000MMF. E. A 1000Ω resistor in parallel with a 1000MMF capacitor is added from terminal A of M7 to ground. F. An 82KΩ, 1 watt resistor is added between terminals A and F of M7. G. L22 is removed from ground and connected to terminal A of M7. H. A 68Ω, ½ watt resistor added from pin 1 of V7 to ground.

MODIFICATION X

LOCATION OF CHANGE	CHANGE MADE
A. Pin 10 of V24.	A. C5 is removed from ground and connected to the 260V line.

MODIFICATION XI

LOCATION OF CHANGE	CHANGE MADE
A. Pin 6 of V3. B. Pin 6 of V4. C. Pin 6 of V5.	A. C31 is increased from 820MMF to 1500MMF. B. C38 is increased from 820MMF to 1500MMF. C. C42 is increased from 820MMF to 1500MMF.

MODIFICATION XII

LOCATION OF CHANGE	CHANGE MADE
A. Video output cathode (pin 1 of V7).	A. A 68Ω, ½ watt resistor added from pin 1 of V7 to ground.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from front panel of cabinet.
2. Disconnect antenna leads.
3. Remove 7 wood screws. Remove rear cover.
4. Disconnect speaker leads, picture tube socket, HV lead and yoke plug.
5. Remove ground lead from HV cage.
6. Remove 6 chassis bolts. Remove chassis.
7. Remove 4 speaker nuts. Remove speaker.

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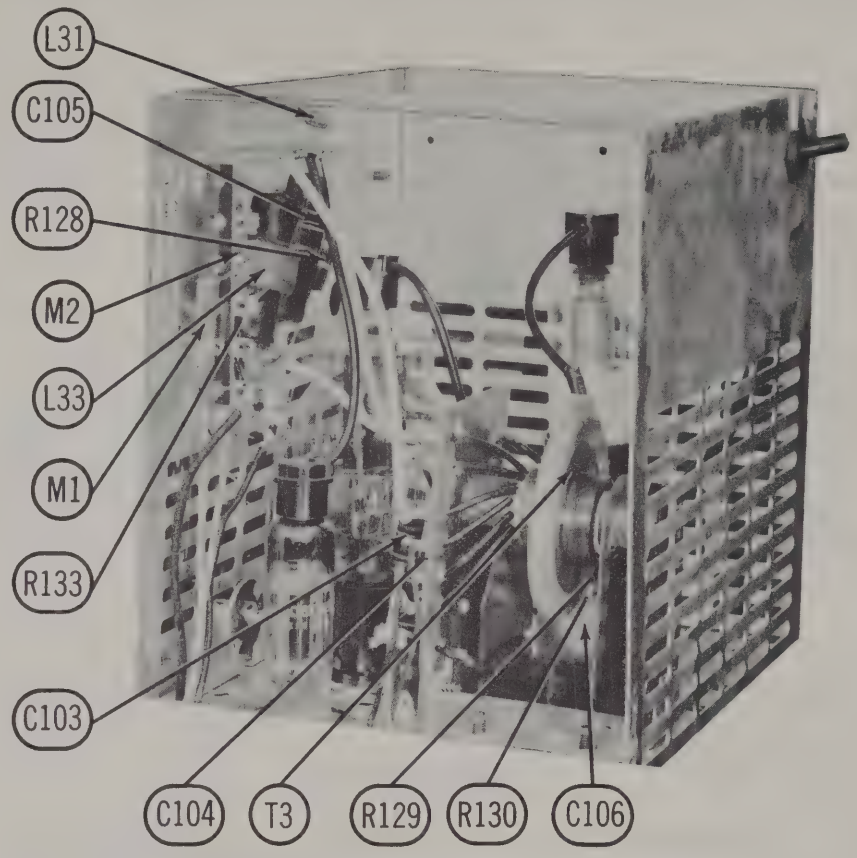
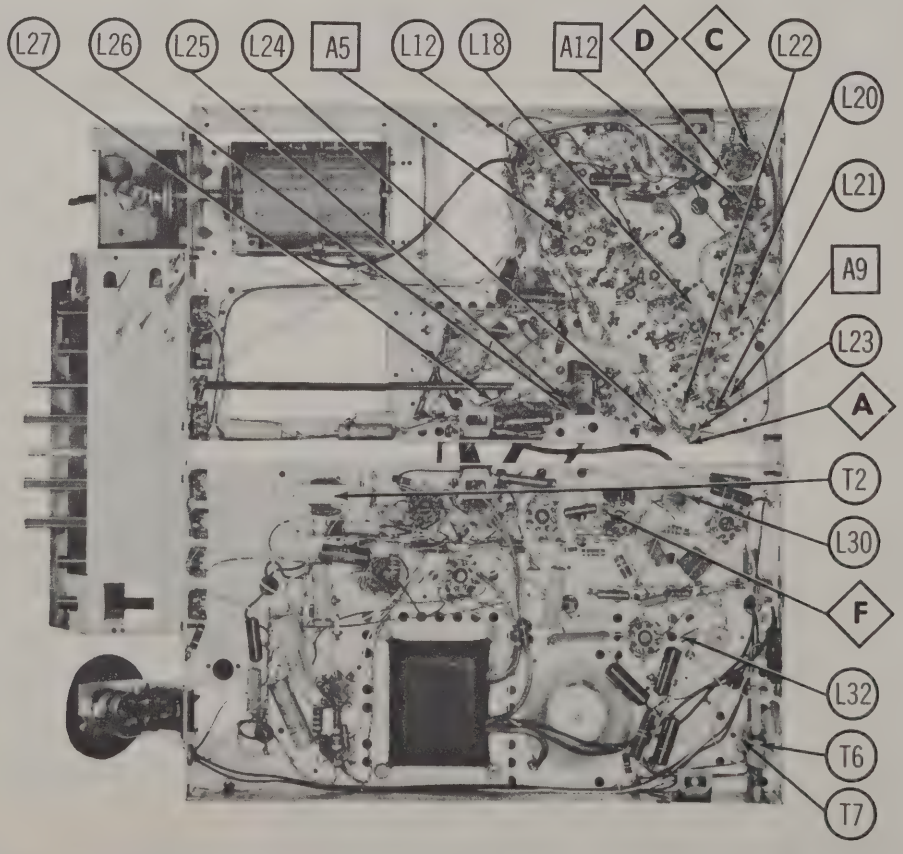


HIGH VOLTAGE COMPARTMENT



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

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TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19, V20 and V21. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C101, C102, C103, C104, C106, R121, R122, R129 and other associated components.	Check L30, C95, C96, C97, C100, R110, R116, R112, R114 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22 and V23. Check adjustments B2, B3 and B4. Check C100, R121, R122, T3, T5A and other associated components.

BLOOMING

Check by substitution V19, V20, V21, V22 and V23. Check T3, T5A, R121, R122, R130, C99, C100, C106 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or no Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

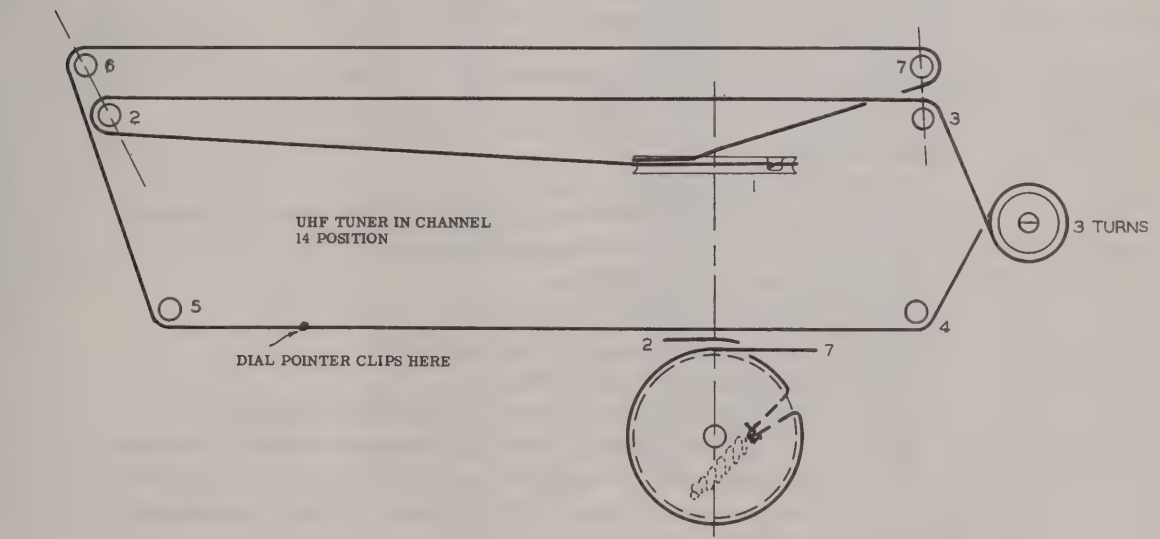
KEYSTONE EFFECT

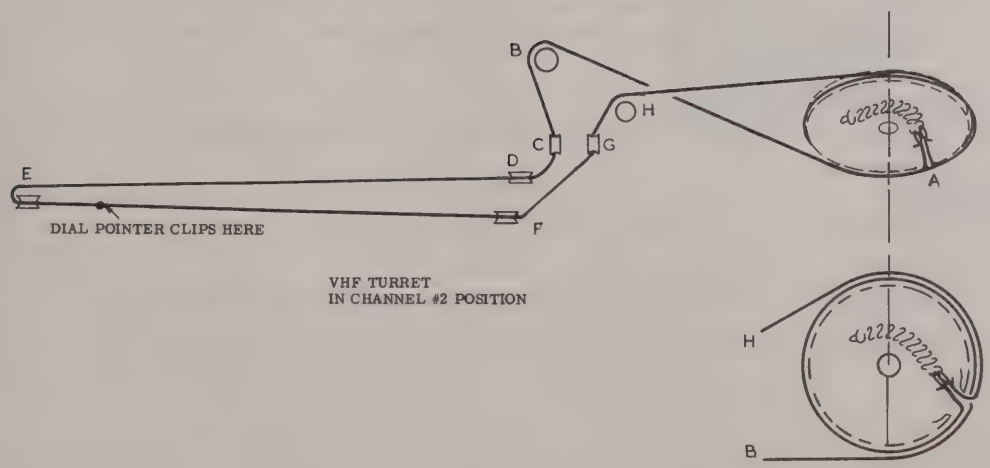
Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.





DRIVE CORD STRINGING

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Remove 6 push-on type control knobs. Remove 4 wood screws holding knob escutcheon insert a long thin screwdriver thru hole in the cabinet to the right of the channel selector shaft.

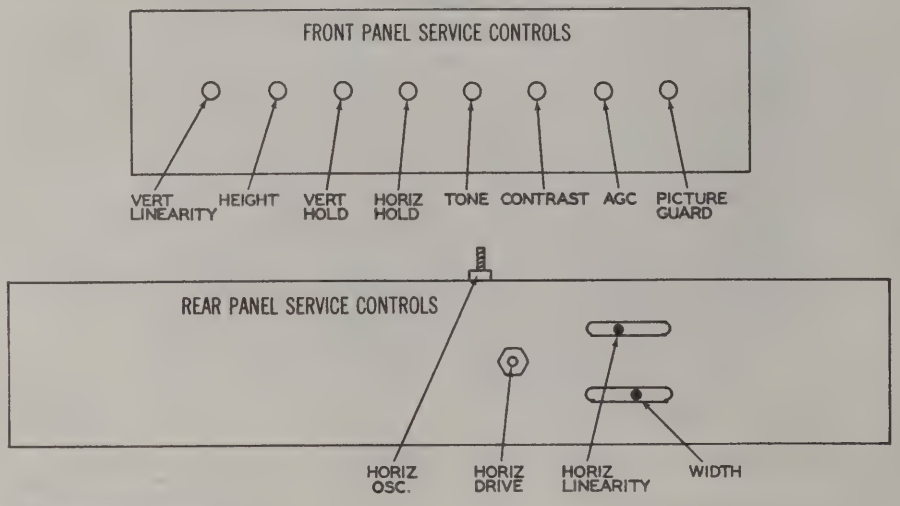
PICTURE TUBE SAFETY GLASS CLEANING

Remove 6 push-on type control knobs and remove 4 wood screws holding knob escutcheon. Remove 3 wood screws holding safety glass clamps. Remove clamps and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS

HALLITRONIC PICTURE CONTROL

In strong signal areas the hallitronic picture control (R10) should be left in its maximum counter clockwise position. In weak signal areas turn R10 clockwise until stable sync is obtained.

AGC CONTROL ADJUSTMENT

Tune in the strongest TV signal available, preferably a test pattern.

Adjust the horizontal and vertical hold controls to their proper adjustments.

Turn the brightness and contrast controls maximum clockwise.

Turn the hallitronic picture guard control (R10) and the AGC control (R9) maximum counter clockwise.

Adjust the AGC control clockwise until picture on screen appears dark slightly unstable sync. Then turn R9 counter clockwise approximately 1/8 turn for stable sync. Switch off channel and back again. Picture should lock-in with both vertical and horizontal sync being stable. If necessary turn R9 farther counter clockwise.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug of L30 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the radio detector secondary of L29 located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

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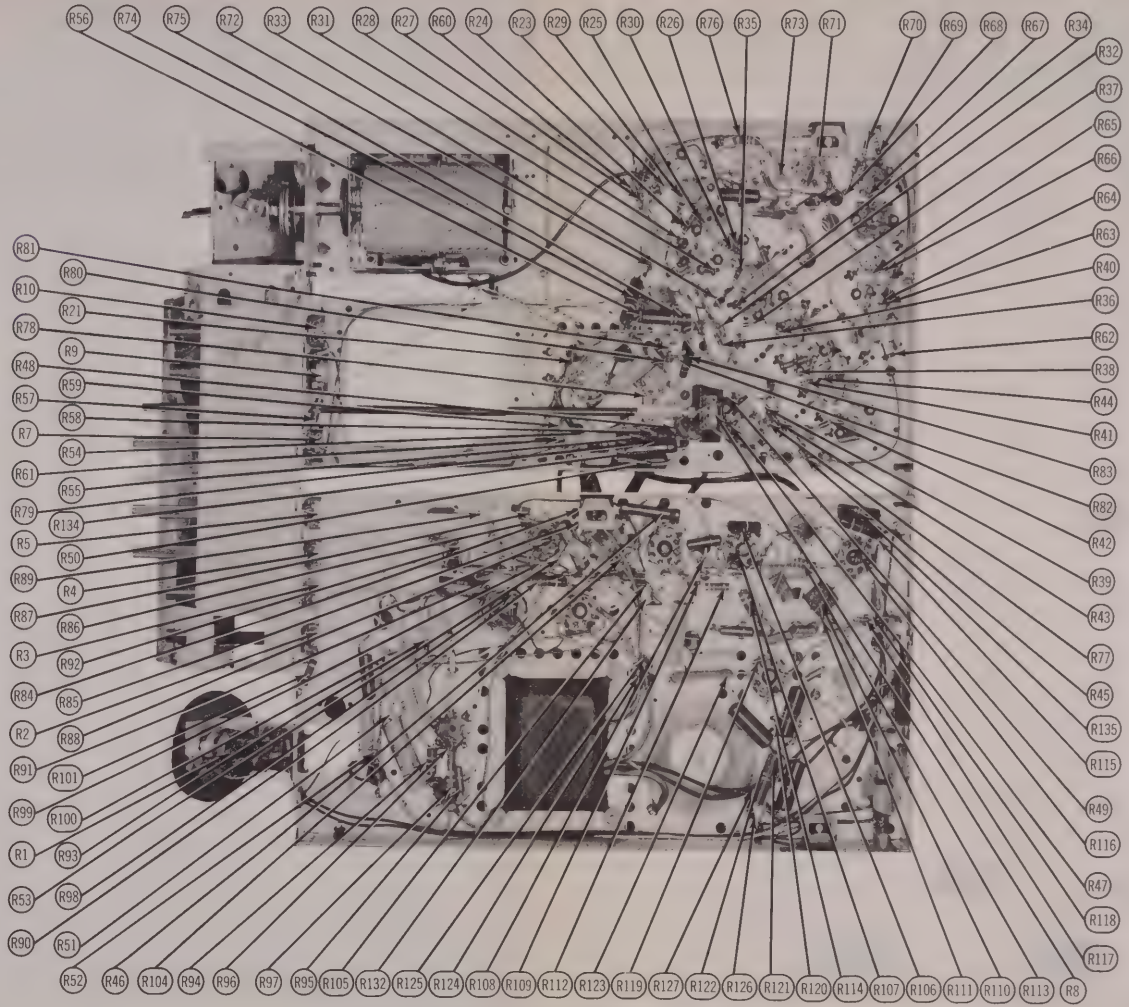

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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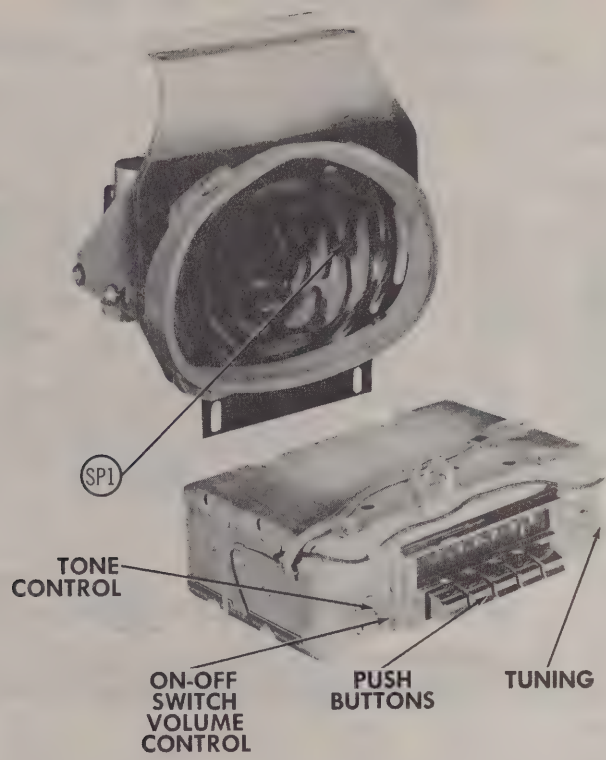
PACKARD
MODEL 472046



PACKARD
MODEL 472046

TRADE NAME	Packard Model 472046
MANUFACTURER	Packard Motor Car Co., Detroit 32, Mich.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Seven)	Types: 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12BF6 Det.-AVC-AF Amp., (2) 12V6GT Output, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.25 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Tone control to mid-range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400%Mod)	High freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	82MMF	Thru dummy to antenna receptacle. Low side to chassis.	1615KC	"	"	A5, A6, A7	Adjust for maximum output after checking A8 (osc.core) should be 1 25/32" between rear of core and mounting end of coil form.
3.	"	"	1000KC	Tune to 1000KC signal	"	A9, A10	Adjust for maximum output.
4.	"	"	1615KC	High freq. end stop	"	A6, A7	"
5.	"	"	900KC	Tune to 900KC signal	"		Set pointer adjustment screw so pointer is at 900KC on dial. With receiver installed and antenna fully extended, tune to weak station between 600KC and 1000KC, adjust A7 for maximum volume.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton to right and out.
2. Tune manually to desired frequency.
3. Push pushbutton all the way in.
4. Repeat on remaining pushbuttons.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		PACKARD PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det.-AVC-AF Amp.	12BF6	12BF6	7BT	
V5	Audio Output	12V6GT	12V6GT	7AC	
V6	Audio Output	12V6GT	12V6GT	7AC	
V7	Rectifier	0Z4	0Z4	4R	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	PACKARD PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■20	400	M-908	FP345.8	TMG3036	T-550	
B	▲20	400					
C	20	25					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

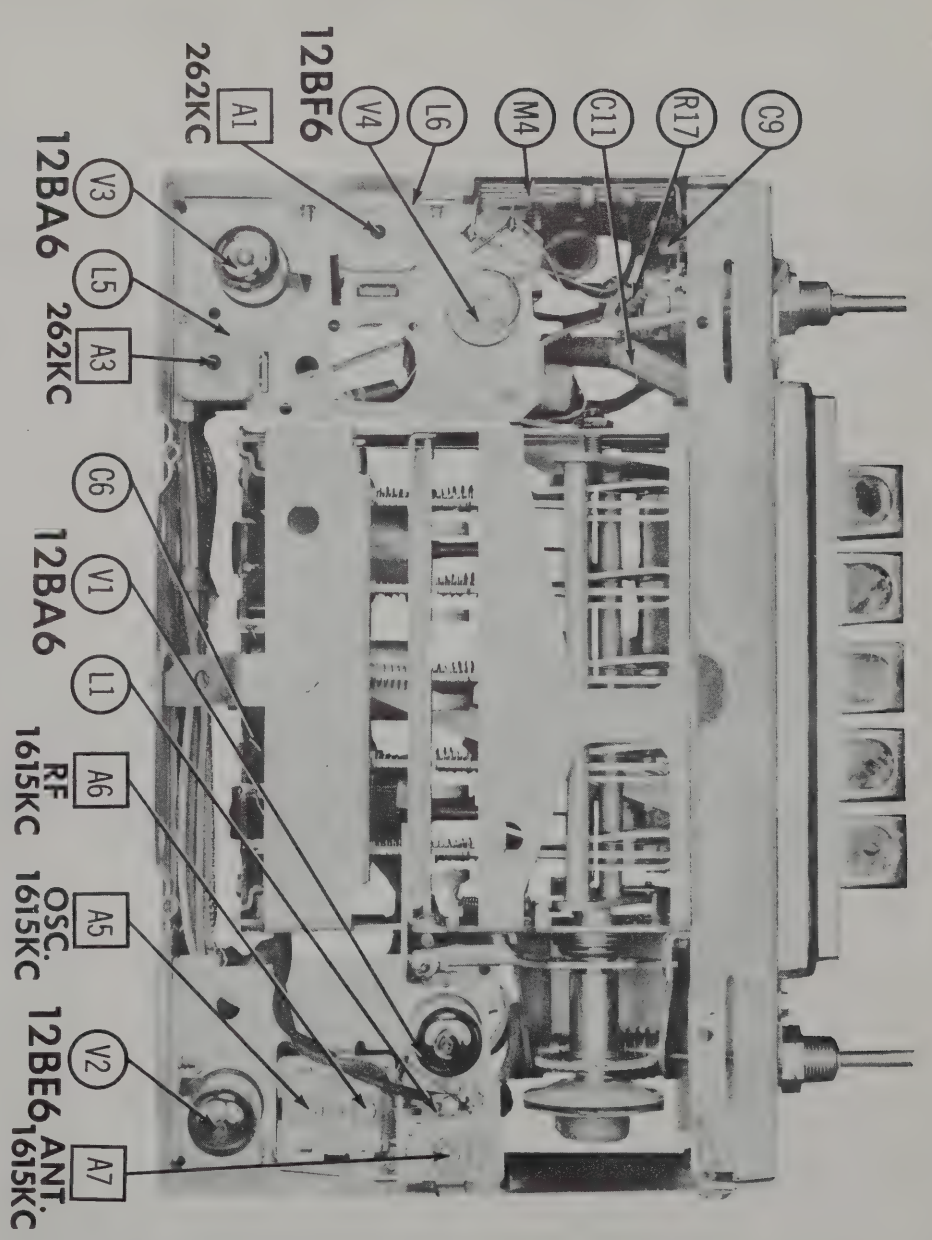
ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	PACKARD PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.05	200	6512	DF-503		PT415	
C3	15		G-150	TCN-15	N750K-150		
C4	39		G-390		N750K-390		
C5	.05	400	6512	DF-503		PT415	
C6	180		7257424				
C7	10	500	G-100	TCZ-10	NP0A-100	MCE215	
C8	.01	400	6510	D6-103	GP3-333-103	PT411	
C9	220	500	G-221	TCZ-220	NP0-335-221		
C10	.002	600	6528	D6-202	GP2-333-202	PT622	
C11	.003	600	6529	D6-302	GP2-333-302	PT623	
C12	.1	400	6513	DF-104		PT401	
C13	100		G-101	DD-101	801-101	UC-531	
C14	.003	1000	H-302	DD16-302	GP2•333-302	PT1623	
C15	.007	1600	H-702	DD16-702		PT1627	
C16	.47	100	7257906			RF480	
C17	.47	100	7257906			RF480	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PACKARD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	1/2	7266140	QJ-827A ♦		F1-68	UF-26A	Tone (Panel)
B	300KΩ					R2-38	UR354-T74	Volume(Rear) tap ②60KΩ
C	Bushing					AK-27	EB-214	Attach to R1A
D	Switch					KB-6	US-26T	Attach to R1B

♦ CONCENTRIKIT EQUIVALENT: K-8 KIT, BASE ELEMENTS & SHAFTS: B13-139, P14-026 (Panel)
B18-132X, R9-112 (Rear)
76-1 (Switch)
S39 (Bushing)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PACKARD PART No.	IRC PART No.	
R2	2.2Meg	½	1239	BTS-2.2Meg	
R3	15KΩ	1	1253	BTA-15K	
R4	68Ω	½	1111	BTS-68	
R5	1Meg	½	1235	BTS-1Meg	
R6	330KΩ	½	1229	BTS-330K	
R7	22KΩ	½	1215	BTS-22K	
R8	15KΩ	2	1277	BTB-15K	
R9	150Ω	½	1115	BTS-150	
R10	47KΩ	½	1219	BTS-47K	
R11	1Meg	½	1235	BTS-1Meg	
R12	1Meg	½	1235	BTS-1Meg	
R13	2200Ω	½	1129	BTS-2200	
R14	27KΩ	1	1256	BTA-27K	
R15	1000Ω	½	1125	BTS-1000	
R16	820KΩ	½	1234	BTS-820K	
R17	82KΩ	½	1222	BTS-82K	
R18	360Ω 5%	1	7234563	BW1-360 5%	
R19	1800Ω	2			Note 1
R20	15KΩ	1	1253	BTA-15K	

Note 1. Mfgr. states to replace with a 2700Ω, 2 watt resistor and 5600, 1 watt resistor in parallel.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PACKARD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @2.05A	560VCT .065A					P-2861	P-6489	22R52	

TRANSFORMER (DRIVER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PACKARD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	1.8KΩ CT (RES)				6061				20A29 ①	

① Use as auto type transformer.

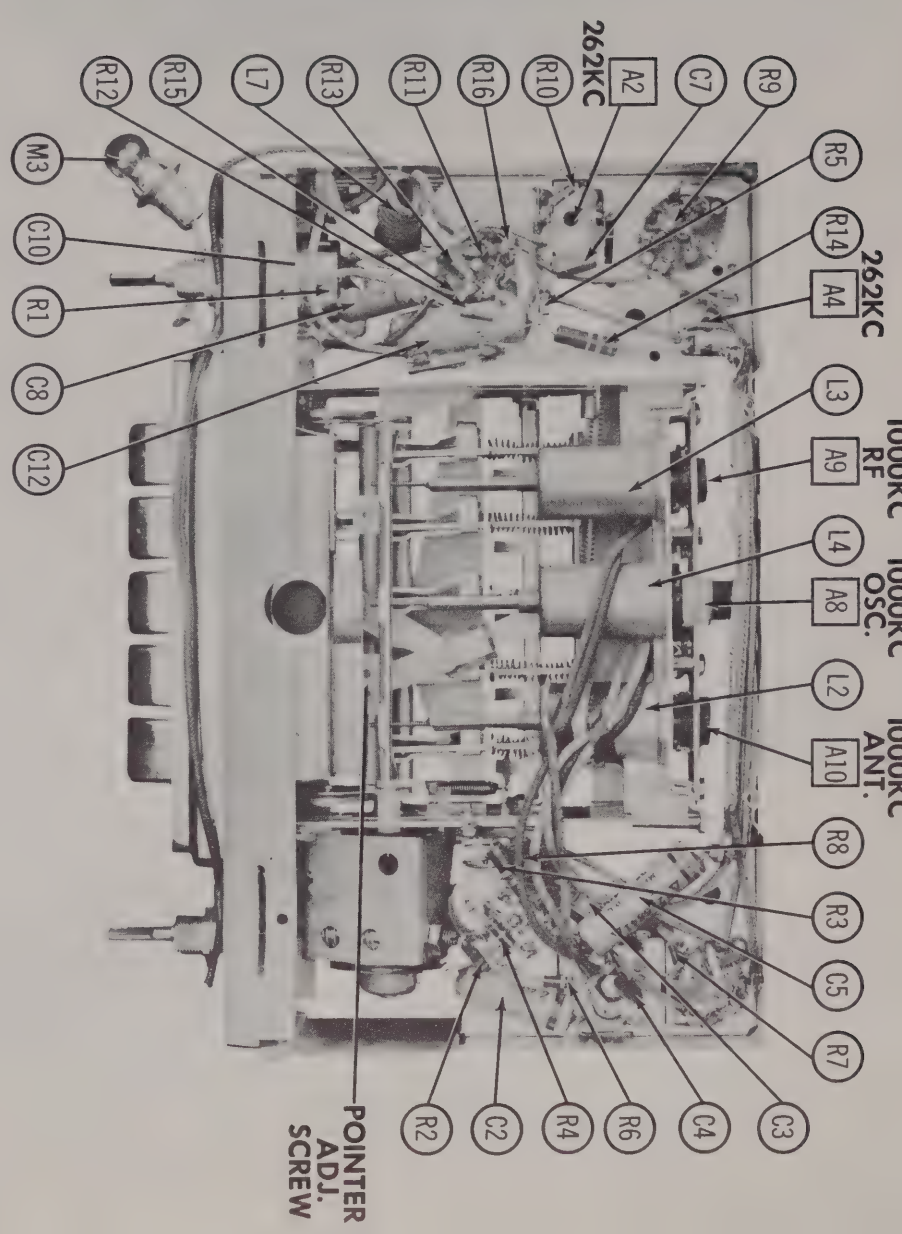
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PACKARD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	7.9KΩ CT	3.8Ω	6063	Z1009	A-2936	A-3852	24S61	S-15X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PACKARD PART No.	QUAM PART No.	
SP1	6 X 9"	PM	3.8Ω	7266144	69A3	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PACKARD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling Coil	.7Ω		7255738	19-1004		4610	
L2	Ant. Coil	10.5Ω		7258914				
L3	RF Coil	10Ω		7258914				
L4	Osc. Coil	1.1Ω	4.6Ω	7258911				
L5	Input IF	33Ω	33Ω	1218725	16-6752	BC-350	12-H1	
L6	Output IF	33Ω	33Ω	1218726	16-6754	BC-354	12-H6	
L7	Fil. Choke	0Ω		1217846	19-4215		5221	
L8	Vib. Hash Choke	.1Ω		7265389				

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				PACKARD PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	12.6V	115∿	8550	6330	G-874 / G-883	6330	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PACKARD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	7AG	7½A	455640		30307.5 (7AG-7½A)		AGW7½	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	PACKARD PART No.	NOTES
M3	Dial Light		#57
M4	Spark Plate	1220368	
A5,A6	Trimmer Cap.	7242454	Dual trimmer (Osc. & RF)
A7	Trimmer Cap.	7265255	Ant. trimmer
	Dial Glass	7266137	
	Pushbutton & Slide Assy.	1220731	

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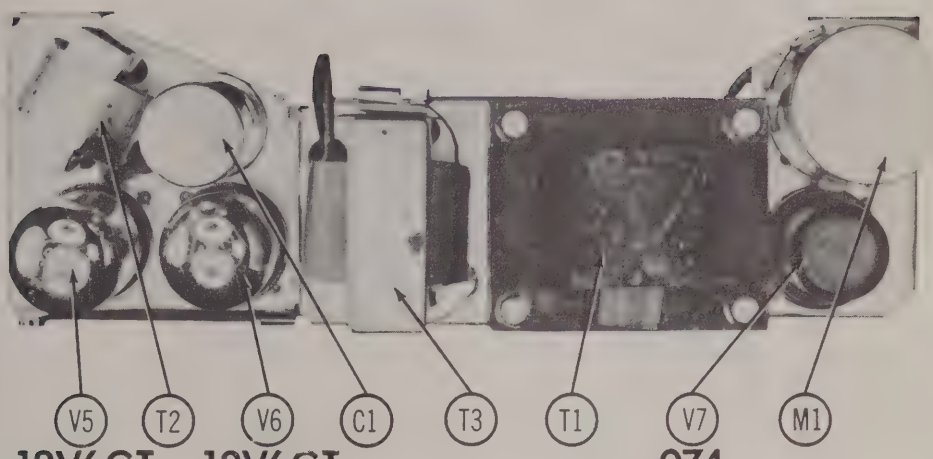

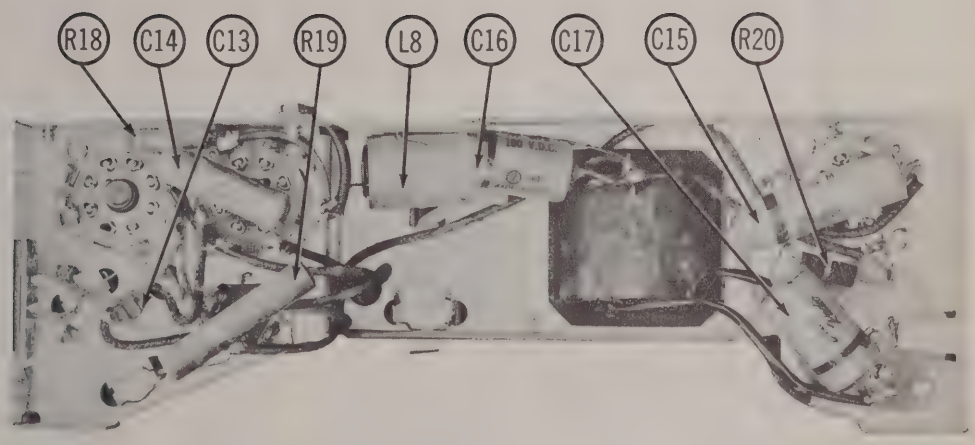

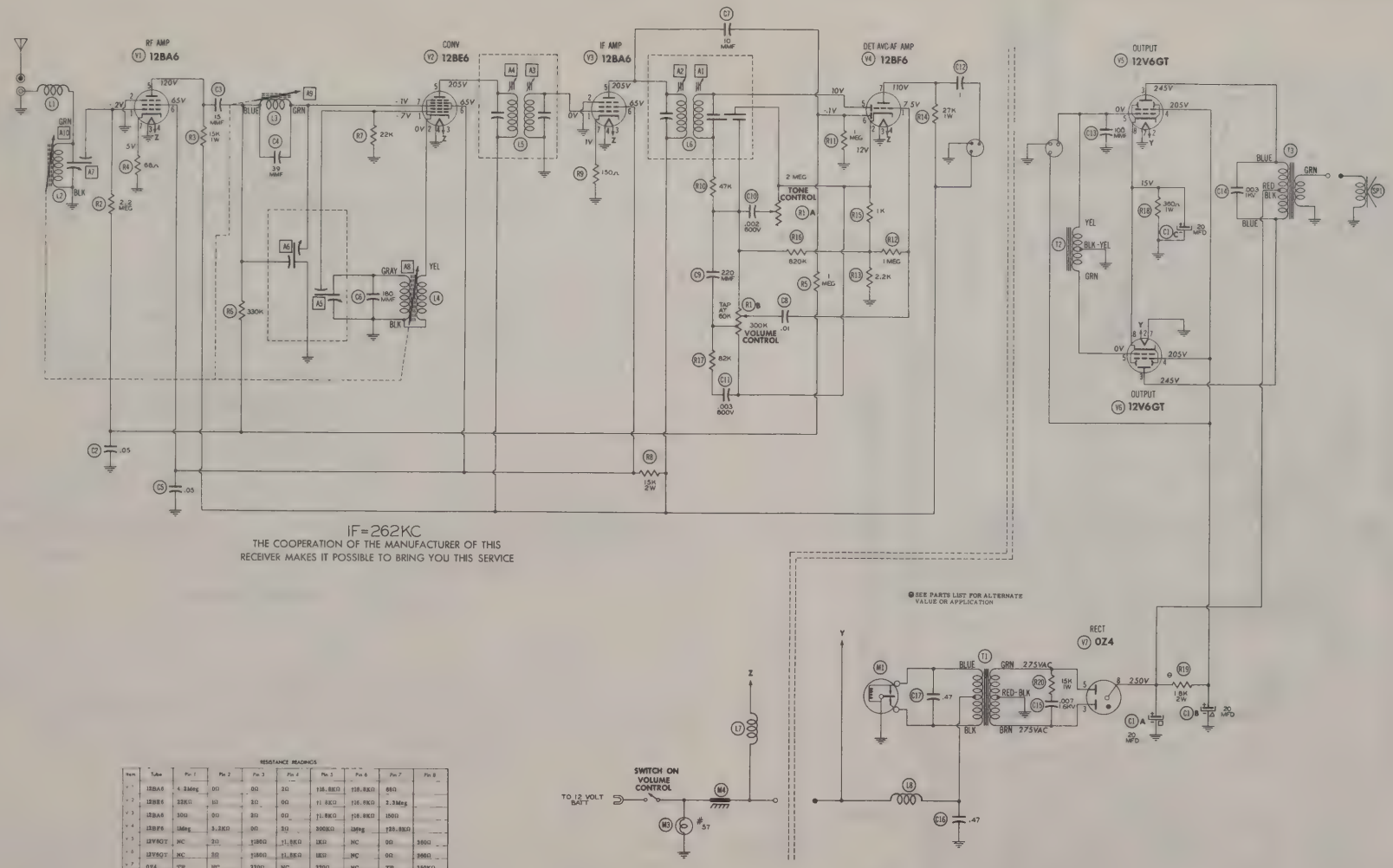

IF=262KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12BA6	4.3Meg	0Ω		0Ω	2Ω	†16.8KΩ	†16.8KΩ	65Ω
V2	12BE6	22KΩ	1Ω		2Ω	0Ω	†1.8KΩ	†16.8KΩ	2.3Meg
V3	12BA6	30Ω	0Ω		2Ω	0Ω	†1.8KΩ	†16.8KΩ	150Ω
V4	12BF6	1Meg	3.2KΩ		0Ω	2Ω	300KΩ	1Meg	†28.8KΩ
V5	12V6GT	NC	2Ω		†180Ω	†1.8KΩ	1KΩ	NC	0Ω	350Ω
V6	12V6GT	NC	2Ω		†180Ω	†1.8KΩ	1KΩ	NC	0Ω	350Ω
V7	0Z4	TP	NC		330Ω	NC	330Ω	NC	TP	350KΩ

† MEASURED FROM PIN 8 OF V7.
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 Volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

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PHOTOFACT* Folder

RETMA MEMBER

RCA VICTOR MODELS 21-CT-55 (Ch. CTC2B & CTC3A)

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MODEL 21-CT-55

RCA VICTOR MODELS
21-CT-55 (Ch. CTC2B & CTC3A)

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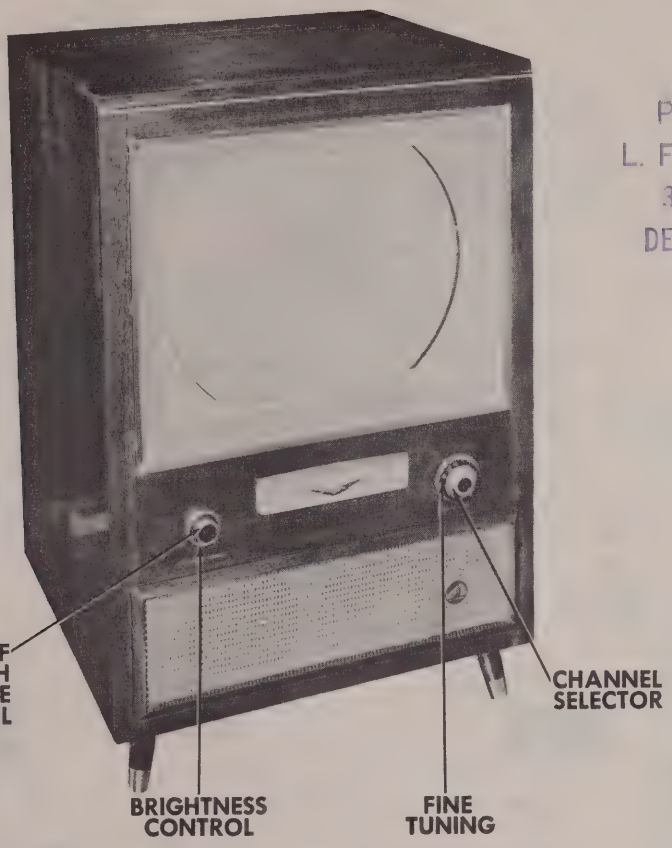
DATE 12–55 SET 300 FOLDER 8



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RCA VICTOR MODELS
21-CT-55 (Ch. CTC2B & CTC3A)

TRADE NAME	RCA Victor Model 21-CT-55 (Ch. CTC2B & CTC3A)
MANUFACTURER	Radio Corp. of America, RCA Victor Television Div., Camden 2, N.J.
TYPE SET	Color Television Receiver
TUBES	Thirty-seven
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 4.6 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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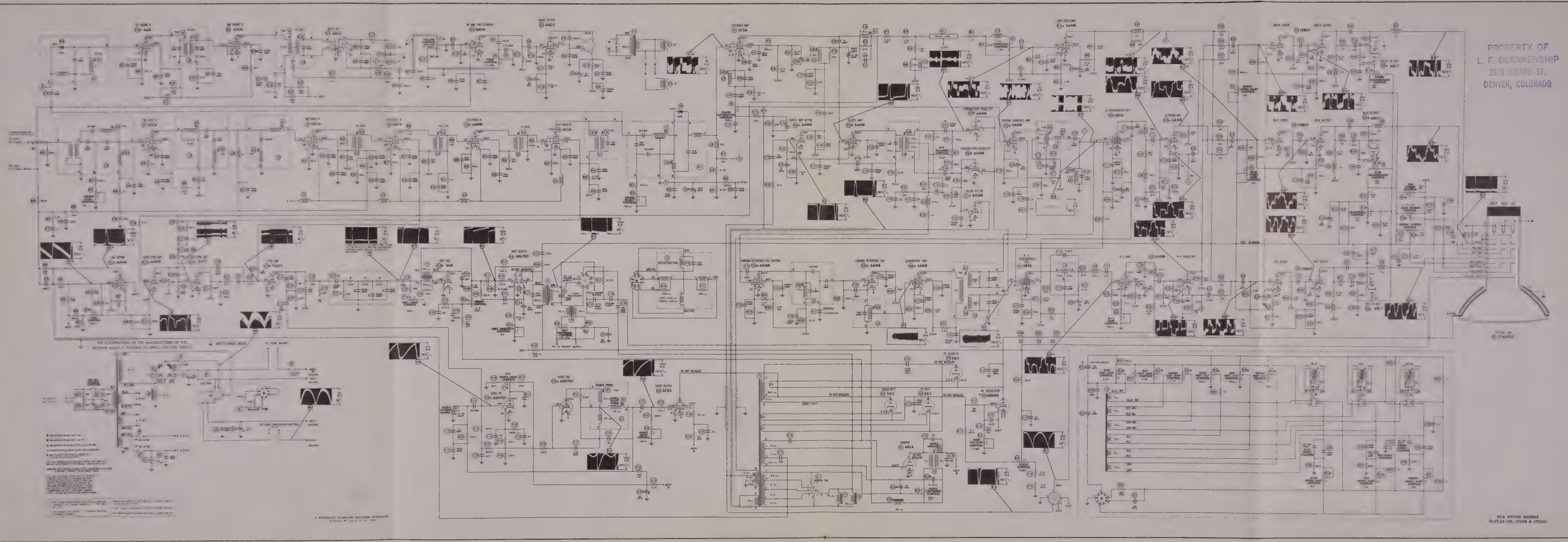

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MISCELLANEOUS ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT

Turn the set on and tune in a TV station, preferably a test pattern. If necessary, synchronize the picture with the horizontal hold control (R7B).

1. Preset the horizontal drive control (R18A) until the white foldover just disappears from the raster.
2. Adjust the horizontal locking range trimmer (B4) one fourth turn from maximum clockwise position. Set the width switch on rear of H. V. compartment to its center position.
3. Adjust the horizontal linearity slug (B2) clockwise for maximum inductance. Set the horizontal hold control to the center of its range.
4. If necessary, adjust the horizontal frequency slug (B3) until the picture synchronizes horizontally.
5. Connect the vertical amplifier of the oscilloscope to terminal "C" of L37. Adjust the horizontal waveform slug (B4) for response similar to Fig. 20. While adjusting B4 keep the picture in sync by readjusting the horizontal hold control. Remove the oscilloscope connect from L37.
6. Set the horizontal hold control to its maximum counter clockwise position. Momentarily remove signal by switching off channel and back again. If picture remains in sync adjust B3 slightly and again switch off channel and back. If necessary, repeat this process until picture falls out of sync with diagonal bars sloping down to the left. Turn the horizontal hold control clockwise noting the least number of diagonal bars obtained just before the picture falls into sync.

Adjust B1 slightly clockwise, if more than three diagonal bars were present before picture pulled into sync. If less than two bars were present, adjust B1 slightly counter clockwise.

7. Turn the horizontal hold control fully counter clockwise and switch off channel and back again and recheck the number of bars present at the pull-in point (90° clockwise rotation). Repeat the above procedure until 2 or 3 bars are present at the pull-in point.

HIGH VOLTAGE ADJUSTMENT

Turn the contrast control and brightness control to their maximum counter clockwise positions.

Connect the probe end of a high voltage probe through a short length of high voltage anode lead to the corona cup on the base of the 3A3 (V24). Common to chassis. Set the meter for a 25KV reading. Turn the high voltage control (R13A on rear of HV cage). for 25KV on VTVM. Turn contrast and brightness controls clockwise until picture appears on picture tube. Adjust the focus control for best focus. Set the width switch for ½ inch horizontal over scan of the viewing area. Turn the horizontal drive control clockwise as far as possible without the presence of white foldover lines in the raster. Adjust the horizontal linearity slug (B2) for a picture symmetrical from left to right. Recheck the operation of horizontal hold control for proper pull-in action as outlined under "Horizontal Oscillator Alignment" (steps 6 and 7).

HIGH VOLTAGE PERFORMANCE CHECK

Connect a 0-1MA DC milliammeter in the cathode circuit(pins 1 & 8)of the 6BD4A (V25). A reading of . 7 MA should be obtained when the high voltage is 25KV. Remove milliammeter and high voltage probe.

Adjust the vertical height and vertical linearity controls so that after final adjustment a vertical overscan of 1/4 inch at top and bottom of viewing area is obtained.

COLOR AFC ALIGNMENT

Connect a 100% saturated color bar generator across the antenna terminals (a TV color signal may be used if available).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
34.	Direct	Use color bar generator. Connect across antenna terminals.			DC probe thru detector probe wide band scope may be used in place of VTVM to terminal "B" of L43. Common to chassis.	A35	Adjust for 5 volts peak to peak on VTVM (or scope
35.	"	"			DC probe thru detector probe to pin 3 (cathode) of 6AN8 (V28B). Common to chassis.	A36, A37	Connect pin 8 (grid)of burst amp. 6AN8(V27A) to chassis with a short jumper. Adjust A36 for maximum deflection, then adjust A37 for minimum deflection. Remove short from pin 8 of V27A.
36.	"	"			DC probe to pins 1 & 2 (plate and grid) of phase det. (6AN8/ V28A). Common to chassis.	A38, A39	Set the hue trimmer control to its mid-range position. Adjust for maximum deflection. A38 will tune very broadly. Adjust A39 near the approximate center of the range at which maximum deflection occurs.
		Note: The burst signal should be checked at this point. Connect the vertical amplifier of the wide band scope to pins 1 and 2 (plate and grid) of 6AN8 (V28A). Check for burst signal waveform similar to Fig. 21. Rotation of horizontal hold control throughout its holding range should not alter waveform shape.					
37.	"	Couple color bar generator across antenna terminals.			DC probe to pins 1 and 2 (plate and grid) of 6AN8 (V28A).	A40	Connect point ⊕ to chassis, with short jumper. Adjust A40 for zero beat (indicated by slow swing of VTVM pointer. Zero beat may also be observed on scope or picture tube screen. Remove short from point ⊕.
38.	"	"			DC probe to point ⊕. Common to chassis.		Shunt 3.58MC crystal (M15) with 15MMF capacitor. Adjust AFC balance control (R17A) for zero reading on VTVM. Remove 15MMF capacitor across M15.

MATRIX ALIGNMENT USING 100% SATURATED COLOR BAR GENERATOR

Connect a 100% saturated color bar generator providing R-Y, B-Y, "Q" and "I" signals across antenna terminals. Adjust contrast and color saturation controls to their mid-range positions. Turn the channel selector switch to the correct channel (channel which crystal has been supplied with color bar generator).

Connect the vertical amplifier of scope to point ⊕. Low side to chassis. Observe the +R-Y signal on scope. Adjust the hue control to its center range position. Switch on B-Y channel and adjust A38 for zero B-Y on scope. Move the vertical amplifier of scope to point ⊕. Low side to chassis.

Observe the -"Q" signal on scope. Switch on the "I" signal and adjust A37 for zero "I" signal on scope.

Connect the vertical amplifier of scope to blue grid of picture tube. Low side to chassis.

Adjust the color saturation control and the R-Y gain control until all color bars containing blue are of equal amplitude and all other color bars are at zero axis on scope. Repeat procedure for green, yellow and red to obtain best cancellation.

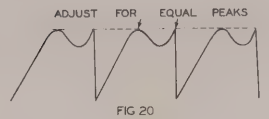


FIG 20

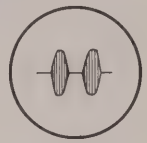


FIG. 21

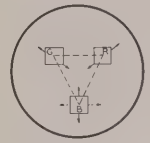


FIG. 22

MATRIX ALIGNMENT USING 100% SATURATED COLOR BAR GENERATOR (Cont)

Move high side of scope to green grid of picture tube and check cancellation of red magenta and blue bars. Move high side to red grid of picture tube and check cancellation of green, blue and cyan bars.

If necessary repeat matrix adjustments until best overall cancellation is obtained.

COMPLETE SETUP PROCEDURE

Before making any picture tube adjustments the "High Voltage Adjustments" under "Horizontal Sweep Circuit Adjustments" should be made.

INITIAL ADJUSTMENTS

Tune in a TV station, preferably a test pattern. It should be possible to sync the picture if the horizontal oscillator and AGC system are operating normally. If the picture will not sync or is the picture is overloading due to misadjustment of the AGC control it may be necessary to readjust the AGC control.

Remove the metal control cover box and snap in cabinet panel below the cover box. Remove the four knobs under the control cover and the two round head screws holding the cover box in place. Carefully remove the cover box by sliding the assembly outward. Remove the cabinet panel by pulling the panel free from its snap mounts.

The AGC control adjustment is now accessible. Do not attempt adjustment of the other accessible controls at this time.

Turn AGC control (R8B) counter clockwise until normal receiver operation is obtained, and the picture can be synchronized.

Adjust the focus control (R16) for best definition of fine picture detail.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT

Turn the horizontal hold control fully counter clockwise. The picture should not loose sync.

Momentarily remove signal by switching off channel and back again. Normally the picture will lose sync. Slowly turn the horizontal hold control in a clockwise direction. The picture should pull in sync before the horizontal hold control has been turned 70 degrees and should remain in sync throughout the balance of clockwise rotation of the control. If the receiver passes the above checks and the picture remains normal and steady the horizontal oscillator is properly aligned. If the receiver does not pass the above checks see "Horizontal Oscillator Alignment" under "Horizontal Sweep Circuit Adjustments".

CENTERING ADJUSTMENT

Adjust the vertical and horizontal centering controls (rear panel) until the picture is centered in the picture tube mask. If the picture does not cover the masked area, adjust the positioning of equal blank areas at top and bottom and each side of picture.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS

Adjust the height and vertical linearity controls (front panel) for a picture that is symmetrical from top to bottom. Final adjustment should overscan the picture mask by 1/4" at top and bottom. Recheck horizontal and vertical centering of the picture.

HORIZONTAL WIDTH, DRIVE AND LINEARITY ADJUSTMENTS

Adjust the width switch (rear panel of HV compartment) to overscan the picture mask by 1/4" horizontally.

Refer to "Horizontal sweep circuit adjustments" for correct setting of horizontal drive control and horizontal linearity coil adjustments.

If the picture mask cannot be filled by the above adjustments refer to the procedure outlined under "High Voltage Adjustments".

PRELIMINARY CONVERGENCE ADJUSTMENTS

Connect the RF output of a white dot generator across the antenna terminals. Preset the Red, Green, and Blue horizontal and vertical amplitude controls (located inside cabinet by removing top) maximum counter clockwise. Preset the Red, Green, and Blue vertical tilt controls to their center range position. Turn dot generator on and set channel selector switch to correct channel to receive a dot pattern on picture tube from the dot generator. Adjust the three converging magnets (small magnets mounted on a knurled nut in a horizontal position).

Note which of these three dots requires positioning then adjust magnet corresponding to that color to correct the position of that dot.

In Fig. 22 the dashed lines indicate the direction of dot movement.

The solid lines indicate the direction of dot movement when the associated converging magnets is adjusted. Each magnet has a slight effect on the two beams other than the one it is intended to control. Adjust the three magnets and the blue beam positioning magnet (located over blue gun next to picture tube socket) to produce a white dot near the center of the screen.

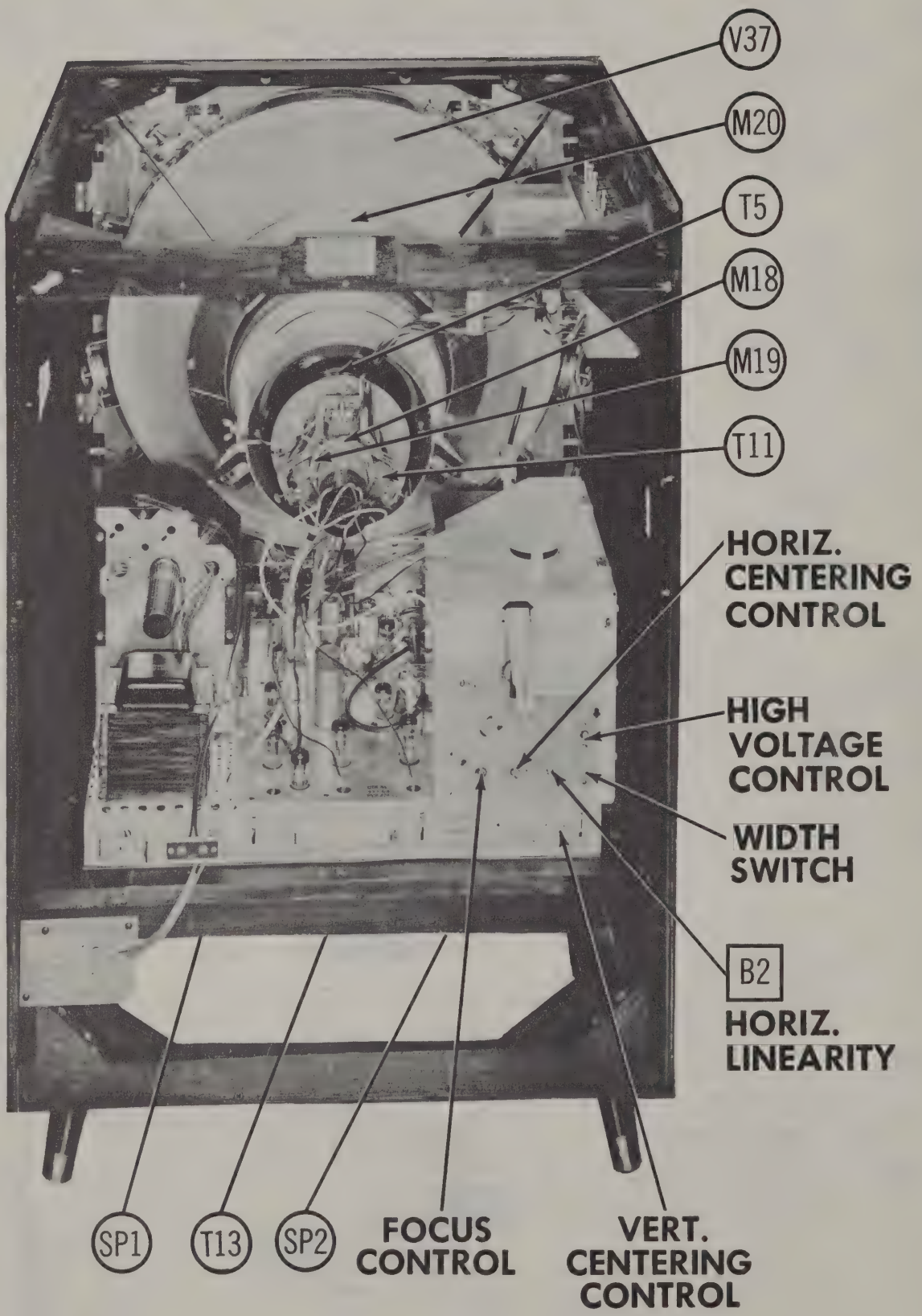
Complete convergence should be obtained at the center of the screen indicated by a white dot with no color fringing around its edges.

COLOR PURITY ADJUSTMENT

Switch channel selector to an unused channel. Turn contrast and color saturation controls to their maximum counter clockwise position. Turn the brightness control maximum clockwise. Set the eight magnets on the field equalizing assembly to their maximum counter clockwise positions.

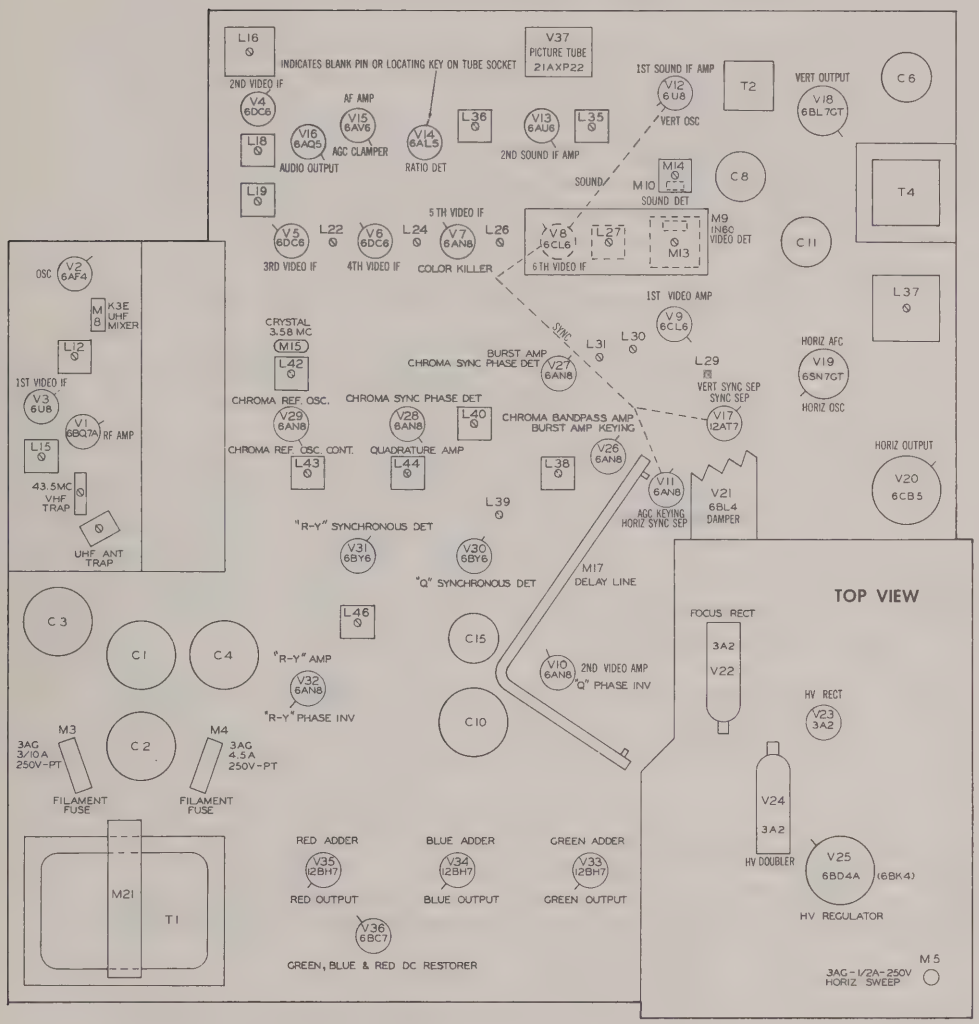
Set the red screen control fully clockwise and the blue screen and green screen controls fully counter clockwise. Loosen the two wing nuts holding yoke assembly so yoke may be moved back and forth. Slide purity magnet assembly toward neck of tube, if necessary to provide yoke clearance.

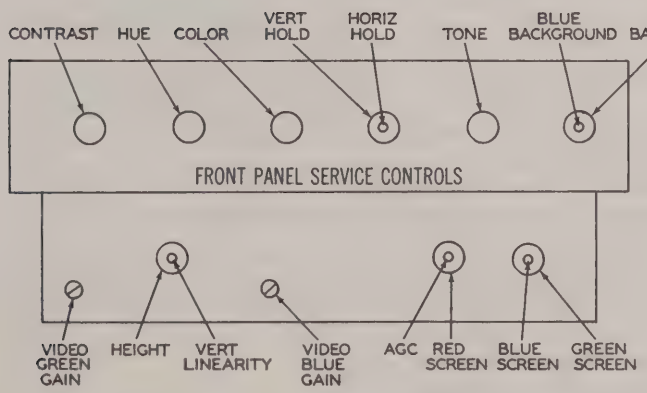
Alternately slide the yoke assembly forward or back and adjust the two purity magnet tabs (or rotate entire assembly) until red purity is obtained with minimum color contamination of the red field. Tighten yoke. Rotate the blue and green screen controls clockwise and adjust all three (red, blue and green) screen controls for a low brightness white raster. If necessary, readjust contrast and brightness controls for proper view of raster.



CABINET-REAR VIEW

TUBE PLACEMENT CHART





PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R4A	2.5Meg		79528	#QJ-658		FI-76	UF25L1 ††	Height-Panel
B	500000					R2-19	UR35L	Vert. Linearity-Rear
								Blue Video Gain
R5	10KΩ		78949					Color Saturation
R6A	5000		79051	Q11-103	A47-500-S	B-4	U-5	Attach to R5A.
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R5A.
R7A	4Meg		78934	**QJ-552		FI-51	UF16L †††	Vert. Hold-Panel
B	500KΩ					R3-39	UR54L	Horiz. Hold-Rear
R8A	15KΩ	2	78938				WP153	Red Screen-Panel(Wire-Wound)
B	5000	1					UR55L	AGC-Rear
R9A	2.5Meg		78941	Q11-339	A47-2.5Meg-S	B-83	U-255	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R8A.
R10A	15KΩ	2	78939				LE789W	Green Screen-Panel(Wire-Wound)
B	15KΩ	2						Blue Screen-Rear(Wire-Wound)
R11A	10KΩ	2	78935				UE705W	Green Background-Panel
								(Wire-Wound)
B	10KΩ	2						Blue Background-Rear
								(Wire-Wound)
R12	750Ω	1	78933					Sound Level
R13A	1.5Meg		79049	Q11-138	A47-1.5Meg-S	DX-742	U-155	High Voltage
B	Shaft		Not Req.	Not Req.	FS-1/4	Not Req.	Not Req.	Attach to R13A.
R14A	1500Ω		79448	WK-1500	A47-1500	VK-130	R1500L	Vert. Centering(Wire-Wound)
B	Shaft		Not Req.	Not Req.	FS-1/4	Not Req.	Not Req.	Attach to R14A.
R15A	100Ω	2	79050	W-100	A48-100	VK-131	M100PX	Horiz. Centering(Wire-Wound)
B	Shaft		Not Req.	Not Req.	FS-1/4	Not Req.	Not Req.	Attach to R15A.
R16	5Meg		79024					Focus
R17A	25KΩ		78952	Q11-130	A47-250K-S	AB-50	U-46	APC-Balance
B	Shaft		Not Req.	Not Req.	ES-3	AE-4	Not Req.	Attach to R17A.
R18	750Ω		78933					Sound Reject
R19A	100KΩ		78950	Q11-128	A 7-100K-S	AD-40	U-41	Horiz. Drive
B	Shaft		Not Req.	Not Req.		AE-4	Not Req.	Attach to R19A.
R20A	500KΩ		79051	Q11-103	A47-500-S	B-4	U-5	R.F.I. Coil
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R20A.
R21A	100KΩ	2	100007	**QJ-650		UF14L	UR54L	Blue Horiz. Amp.-Panel
B	10KΩ		Not Req.	Not Req.		R3-35	UR16L	Blue Horiz. Amp.-Rear
R22A	10KΩ	1	79859	Q17-116	A47-10K-V	AB-17	U-19	Green Horiz. Amp.
B	Shaft		Not Req.	Not Req.	ES-3	AE-4	Not Req.	Attach to R22A.
R23A	500Ω	2	100006	††QJ-651		FI-1	UF52L	Blue Vert. Tilt-Panel
B	2500Ω					R2-13	UR25L	Blue Vert. Amp.-Rear
R24A	500Ω	2	100006	††QJ-651		FI-1	UF52L	Red Vert. Tilt-Panel
B	2500Ω					R2-13	UR25L	Red Vert. Amp.-Rear
R25A	500Ω	2	100006	††QJ-651		FI-1	UF52L	Green Vert. Tilt-Panel
B	2500Ω					R2-13	UR25L	Green Vert. Amp.-Rear

+ CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS & SHAFTS: B17-116 & P9-101 (Panel)
B11-123 & R11-13 (Rear)

++CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS & SHAFTS: B11-103 & P9-101 (Panel)
B11-121 & R11-13 (Rear)

+ CONCENTRIKIT EQUIVALENT: K-3 KIT, BASE ELEMENTS & SHAFTS: W11-114 & P5-118 (Panel)
B13-137X & R1-307 (Rear)
76-1 Switch

**CONCENTRIKIT EQUIVALENT: K-3 KIT, BASE ELEMENTS & SHAFTS: B11-137 & P9-104 (Panel)
B11-123 & R11-13 (Rear)

◊ CONCENTRIKIT EQUIVALENT: K-5 KIT, BASE ELEMENTS & SHAFTS: B11-139 & P11-018 (Panel)
B11-114 & R15-014 (Rear)

† Universal Replacement (Mallory Exact Duplicate Part No. UE502WS)
††Universal Replacement (Mallory Exact Duplicate Part No UE-3050)
†††Universal Replacement (Mallory Exact Duplicate Part No UE-3150)
* Universal Replacement (Mallory Exact Duplicate Part No. UE813W)
• Universal Replacement, (Mallory Exact Duplicate Part No UE685)
•• Universal Replacement (Mallory Exact Duplicate Part No. UE14)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RCA Victor PART No	IRC PART No	NOTES
R26	100KΩ		503410	BTS-100K	
R27	100KΩ		503410	BTS-100K	
R28	22KΩ		503323	BTS-22K	
R29	1200		503112	BTS-120	
R30	8.2Meg		503562	BTS-8.2Meg	
R31	220KΩ		502422	BTS-220K	
R32	270KΩ		502427	BTS-270K	
R33	1000Ω		503210	BTS-1000	
R34	100KΩ		503310	BTS-100K	
R35	47Ω		503047	BTS-47	
R36	10KΩ		503310	BTS-10K	
R37	1000Ω		503210	BTS-1000	
R38	10KΩ	10	79337	1 3/4A-10K	
R39	100Ω		503100	BTS-100	
R40	56Ω		503056	BTS-56	
R41	68Ω		503068	BTS-68	
R42	4700Ω		503247	BTS-4700	
R43	12KΩ		503312	BTS-12K	
R44	100Ω		503100	BTS-100	
R45	3.3Meg 5%		502533	BTS-3.3Meg	
R46	3500 5%		502156	BTS-590 5%	
R47	3300 5%		503133	BTS-330 5%	
R48	1000Ω		503210	BTS-1000	
R49	820Ω 5%		3579	BTS-82 5%	
R50	47KΩ		513547	BTA-47K	
R51	10KΩ		503310	BTS-10K	
R52	820 5%		3579	BTS-82 5%	
R53	2300Ω 5%		503423	BTS-2300 5%	
R54	10KΩ		503310	BTS-10K	
R55	39KΩ 5%			BTS-39K 5%	
R56	33KΩ 5%		502333	BTS-33K 5%	
R57	820 5%		3579	BTS-82 5%	
R58	100		502010	BTS-100	
R59	10KΩ		503310	BTS-10K	
R60	12KΩ 5%			BTS-12K 5%	
R61	1000Ω			BTS-1000	
R62	150Ω		503115	BTS-150	
R63	10KΩ	2	522310	BTB-10K	
R64	3900Ω 5%		503433	BTS-3900 5%	
R65	270Ω 5%		503127	BTS-270 5%	
R66	2200	5	79908		
R67	330Ω 5%		503133	BTS-330 5%	
R68	220KΩ 5%		502422	BTS-220K 5%	
R69	2200Ω 5%		502222	BTS-2200 5%	
R70	4700Ω 5%		502347	BTS-4700 5%	
R71	10KΩ		503310	BTS-10K	
R72	1800 5%		513218	BTA-180 5%	
R73	330Ω		503133	BTS-330	
R74	270Ω 5%		503127	BTS-270 5%	
R75	12500Ω	10	79154		
R76	10KΩ	10	79852		
R77	22000 5%	3	522323	BTB-2200 5%	
R78	15000 5%	2	522215	BTB-1500 5%	
R79	1800 5%	1	512218	BTA-1800 5%	
R80	1200Ω		503212	BTS-1200	
R81	1000 5%		502211	BTS-1000 5%	
R82	2700Ω		503227	BTS-2700	
R83	2.2Meg		503523	BTS-2.2Meg	
R84	220Ω		503122	BTS-220	
R85	1500Ω		503215	BTS-1500	
R86	47KΩ	1	512347	BTA-47K	
R87	4700 5%		502447	BTS-470K 5%	
R88	820KΩ 5%		523482	BTS-820K 5%	
R89	82Ω 5%		503082	BTS-82 5%	
R90	22KΩ		512322	BTA-22K	
R91	2200Ω		503222	BTS-2200	
R92	10KΩ		513310	BTA-10K	
R93	47KΩ		503347	BTS-47K	
R94	68KΩ	2	522368	BTB-68K	
R95	2.2Meg		503523	BTS-2.2Meg	
R96	4.7Meg		513547	BTS-4.7Meg	
R97	470KΩ 5%		502447	BTS-470K 5%	
R98	820KΩ 5%		523482	BTS-820K 5%	
R99	82Ω 5%		503082	BTS-82 5%	
R100	22KΩ		512322	BTA-22K	
R101	22KΩ	2	522322	BTB-22K	
R102	47KΩ	2	503347	BTS-47K	
R103	18KΩ		503318	BTS-18K	
R104	56KΩ	2	522356	BTB-56K	
R105	33KΩ	2	523354	BTB-56K	
R106	39KΩ		513339	BTA-39K	
R107	470 5%		502047	BTS-47 5%	
R108	39KΩ		503339	BTS-39K	
R109	1200 5%		502212	BTS-1200 5%	
R110	33KΩ		503333	BTS-33K 5%	
R111	10KΩ 5%		502310	BTS-10K 5%	
R112	10000 5%		502320	BTS-10000 5%	
R113	22KΩ			BTS-22K	
R114	10Meg		503510	BTS-10Meg	
R115	330KΩ		503433	BTS-330K	
R116	470KΩ		503447	BTS-470K	
R117	330Ω		79460		
R118	330Ω	1	79465		
R119	470Ω	2	522147	BTB-470	
R120	27KΩ	1	503327	BTS-27K	
R121	680KΩ		503468	BTS-680K	
R122	22KΩ		502322	BTS-22K	
R123	3900Ω		503239	BTX-3900	
R124	56KΩ		503356	BTS-56K	
R125	270KΩ		503427	BTS-270K	
R126	2.2Meg		503523	BTS-2.2Meg	
R127	820KΩ		503483	BTS-820K	
R128	560KΩ		503466	BTS-560K	
R129	47KΩ		503347	BTS-47K	
R130	47KΩ		503347	BTS-47K	
R131	1.5Meg		503512	BTS-1.5Meg	
R132	33KΩ		523333	BTB-33K	
R133	18KΩ		503318	BTS-18K	
R134	8200Ω		503383	BTS-8300	
R135	33KΩ		503333	BTS-33K	
R136	22KΩ		503322	BTS-22K	
R137A	22KΩ			BTS-22K	
B	22KΩ		#79346	BTS-22K	
C	8200Ω			BTS-8200	
D	8200Ω			BTS-8200	
R138	1Meg		503510	BTS-1Meg	
R139	1Meg		503510	BTS-1Meg	
R140	1.5Meg		503518	BTS-1.5Meg	
R141	2.7Meg	2	523537	BTB-2.7Meg	
R142	470KΩ		503447	BTS-470K	
R143	22KΩ 5%		502322	BTS-22K 5%	
R144	100KΩ		503410	BTS-100K	
R145	2.2Meg	2	503523	BTS-2.2Meg	
R146	4.7Ω	1	513147	BTA-4.7Ω	
R147	100KΩ	2	522410	BTB-100K	
R148	150KΩ	2	522415	BTB-150K	
R149	82Ω 5%	2	523182	BTB-82Ω 5%	
R150	100KΩ		513410	BTA-100K	
R151	82KΩ	1	512392	BTA-82K	
R152	150KΩ 5%		512415	BTA-150K 5%	
R153	820KΩ		513482	BTA-820K	
R154	82KΩ	1	512392	BTA-82K	
R155	150KΩ 5%		512415	BTA-150K 5%	
R156	3900Ω 5%		503239	BTS-3900 5%	
R157	56KΩ		513356	BTA-56K	
R158	82KΩ	1	512382	BTA-82K	
R159	100KΩ 5%		512410	BTA-100K 5%	
R160	150KΩ	2	522415	BTB-150K	
R161	8200Ω 5%		503283	BTS-8200 5%	
R162	39KΩ		513339	BTA-39K	
R163	220KΩ		502422	BTS-220K	
R164	120Ω		503112	BTS-120	
R165	1MΩ	10	79907		
R166	56Ω		502056	BTS-56	
R167	4700Ω	1	512347	BTA-4700	
R168	56KΩ			BTS-56K	
R169	6.2Meg 2%	2	523563	BTB-6.2Meg 2%	
R170	8.2Meg 2%	3	523583	BTB-8.2Meg 2%	
R171	2.7Meg 2%	3	523327	BTB-2.7Meg 2%	
R172	56Meg	2	100010		
R173	4.5Meg	1	100009	BTA-4.7Meg	
R174	4700Ω		503347	BTS-4700	
R175	10KΩ		503310	BTS-10K	
R176	150Ω		502115	BTS-150	
R177	33KΩ		513339	BTA-39K	
R178	2700Ω	1	503227	BTS-2700	
R179	10KΩ	1	513310	BTA-10K	
R180	56KΩ	1	503356	BTS-56K	
R181	10KΩ	1	503310	BTS-10K	
R182	22KΩ	1	502322	BTS-22K	
R183	100KΩ	1	503410	BTS-100K	
R184	1800Ω	1	512318	BTA-1800	
R185	39KΩ 5%	2	523339	BTB-39K 5%	
R186	33KΩ 5%	2	522330	BTB-39K 5%	
R187	22000 5%	3	502223	BTS-2200 5%	
R188	33KΩ			BTS-33K	
R189	2200Ω		503222	BTS-2200	
R190	10KΩ		503310	BTS-10K	
R191	1Meg 5%	1	502510	BTS-1Meg 5%	
R192	1Meg 5%	1	502510	BTS-1Meg 5%	
R193	15KΩ		503315	BTS-15K	
R194	22Meg 5%	2	522622	BTB-22Meg5%	
R195	1Meg 5%	1	502510	BTS-1Meg 5%	
R196	27KΩ		503327	BTS-27K	
R197	15KΩ		503315	BTS-15K	
R198	1000Ω 5%		502310	BTS-1000 5%	
R199	3300 5%	1	502133	BTS-330Ω 5%	
R200	27KΩ		523327	BTB-27K	
R201	12KΩ	1	513312	BTA-12K	
R202	2200Ω		503222	BTS-22K	
R203	150KΩ	1	512415	BTS-150K	
R204	39KΩ	2	523339	BTB-39K	
R205	180Ω	1	503118	BTS-180	
R206	47KΩ	1	512347	BTA-47K	
R207	3300Ω	5	502303	BTS-3300	
R208	56Ω		502056	BTS-56	
R209	560Ω 5%			BTS-560 5%	

• Items R137A, R137B, R137C, R137D, C105A, C105B, C105C, C105D are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI	SEC. 1	SEC. 2	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	170VAC	6.3VAC	79971						
	②&⑥ 6A	.695ADC	⑨1A							
		SEC. 3	SEC. 4	SEC. 5						
	6.3VAC									
	⑨1.72A									

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RCA Victor PART No	IRC PART No	NOTES
R210	100Ω		503110	BTS-100	
R211	12.5KΩ	10	79384		
R212	183Ω 2%	1	513218	BTA-182K 2%	
R213	4700Ω		503347	BTS-4700	
R214	4700Ω		503439	BTS 390K	
R215	6.8Meg		502568	BTS-6.8Meg	
R216	30000Ω 5%	3	19794	BTS-3000 5%	
R217	33KΩ 5%	1	513338	BTA-33K 5%	
R218	100Ω		503110	BTS-100	
R219	47000Ω 5%	1	502347	BTS-4700 5%	
R220	500Ω	7	79883		
R221	4700Ω 5%		502347	BTS-4700 5%	
R222	82000Ω		503283	BTS-8300	
R223	1Meg		503510	BTS-1Meg	
R224	100Ω	2	503110	BTS-100	
R225	47KΩ	1	512347	BTA-47K	
R226	47000Ω 5%		502347	BTS-4700 5%	
R227	3.3Meg		503533	BTS-3.3Meg	
R228	390KΩ		503439	BTS-390K	
R229	62000Ω 5%	1	35255	BTA-6200 5%	
R230	10KΩ 5%	2	522310	BTB-10K 5%	
R231	10000Ω 5%	2	502310	BTS-10K 5%	
R232	10KΩ 5%		502310	BTS-10K 5%	
R233	10KΩ 5%		502310	BTS-10K 5%	
R234	10KΩ 5%		502310	BTS-10K 5%	
R235	10KΩ 5%		502310	BTS-10K 5%	
R236	10KΩ 5%		502310	BTS-10K 5%	
R237	20KΩ 5%		502320	BTS-20K 5%	
R238	47KΩ 5%		502347	BTS-47K 5%	
R239	680Ω		502168	BTS-680	
R240	3300Ω 5%	1	502233	BTS-3300 5%	
R241	2000Ω 5%	2	522310	BTB-10K 5%	
R242	1.6Meg		502518	BTS-1.6Meg	
R243	270Ω 5%	1	502127	BTS-270 5%	
R244	180Ω 5%	1	502118	BTS-180 5%	
R245	47000 5%	2	522347	BTB-4700 5%	
R246	15KΩ	1	503315	BTS-15K	
R247	100KΩ		503410	BTS-100K	
R248	1Meg		503510	BTS-1Meg	
R249	470Ω		503147	BTS-470	
R250	33000 5%	2	502333	BTS-3300 5%	
R251	180Ω 5%	1	502318	BTS-180 5%	
R252	1.6Meg		502568	BTS-1.6Meg	
R253	270Ω 5%	1	502127	BTS-270 5%	
R254	180Ω 5%	1	502118	BTS-180 5%	
R255	47000 5%	2	522347	BTB-4700 5%	
R256	15KΩ	1	503315	BTS-15K	
R257	100KΩ		503410	BTS-100K	
R258	1Meg		503510	BTS-1Meg	
R259	33000 5%	2	502333	BTS-3300 5%	
R260	1200 5%	1	512112	BTA-120 5%	
R261	910 5%	1	502092	BTS-82 5%	
R262	10KΩ 5%	2	522310	BTB-10K 5%	
R263	1.6Meg		502518	BTS-1.6Meg	
R264	2700 5%	1	502127	BTS-270 5%	
R265	1800 5%	1	502118	BTS-180 5%	
R266	47000 5%	2	522347	BTB-4700 5%	
R267	15KΩ	1	503315	BTS-15K	
R268	100KΩ	1	503410	BTS-100K	
R269	1Meg	1	503510	BTS-1Meg	
R270	82000 5%	2	79782		
R271	220KΩ	5			
R272	10KΩ 5%		79907	BTS-10K 5%	
R273	4000Ω	5	78907	PW7-4000	
R274	33000	1	79782		
R275	100KΩ	1	503410	BTS-100K	
R276	10KΩ	1	512310	BTA-10K	
R277	100KΩ	2	522410	BTB-100K	
R278	100KΩ	2	522410	BTB-100K	
R279	100KΩ	2	522410	BTB-100K	
R280	22KΩ	2		BTB-22K	
R281	22KΩ	2		BTB-22K	
R282	22KΩ	2		BTB-22K	
R283	56KΩ	1	503356	BTS-56K	
R284	56KΩ	1	503356	BTS-56K	
R285	20KΩ	20		2D-20K	
R286	820Ω	1		BTS-820	
R287	820Ω	1		BTS-820	
R288	820Ω	1		BTS-820	
R289	100KΩ	1	502210	BTS-100K	
R290	1000Ω	1	502210	BTS-1000	
R291	1000Ω	1	502210	BTS-1000	
R292	1000Ω	1	502210	BTS-1000	
R293	1000Ω	1	502210	BTS-1000	
R294	560Ω	1	503156	BTS-560	
R295	1000Ω	1	502210	BTS-1000	
R296	90Ω	15	79973		

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert.Osc. Trans.	74164	B6701	A-4003		V403	A-8123	32A03③	A-97Y
T3	Horiz.Output Trans.	79643							
T4	Vert.Output Trans.	79530	E1906①②	A-3823 ①		V301①	A-8165	36S73 ①	A-102X①
T5A	Yoke-Horiz. (L. 94MH)	79605 ①							
B	Vert. (50MH)								
T6	Horiz. Lin. Coil								
	(.94H-.94MH) ④	79648							
T7	Width Choke(1.0MH)	79787							
T8	Width Choke(1.0MH)	79787							
T9	Vert.Centering Choke	79900							
T10	Horiz.Centering Choke	79644							
T11A	Green Dynamic Con-	100019 ⑤							
B	Blue } vergence Yoke	100020 ⑤							
C	Red } Assy.	100021 ⑤							
		79616 ⑧							
T12	Dynamic Convergence	79684							
	Inductor Assy.								

① Drill new mounting hole(s).
② Use 9 to 1 turns ratio.
③ Includes capacitor C139, resistors R150 and R151.
④ Two coils, bifilar wound. Total inductance, coils connected series aiding (.17-1.46MH).
⑤ Pole piece emitter coil (3 used).
⑥ Control magnet and knob assembly (3 used).
⑦ Pole piece magnet assembly (3 used).
⑧ Main plug for emitter coil (3 used).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA RCA Victor PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T13	6KΩ	1.73Ω	79986	Z1007	A-2901	A-3849	24S61	S-53X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP	REPLACEMENT DATA RCA Victor PART No	CHAM PART No	NOTES
SP1	8"	PM	3.3Ω	74864	8A31	
SP2	8"	PM	3.3Ω	74864	8A3.	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA RCA Victor PART No	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω		77836				
L2	IF Trap	0Ω		77626				
L3A	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77603				Channels 2-4, includes capacitors.
B	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77603				Channels 5-6, includes capacitors
C	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77804				Channels 7-10, includes capacitors
D	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77805				Channels 11-13, includes capacitors
E	UHF Ant., RF, Mixer & Osc. Coils	0Ω						Channels 14-52, includes capacitors
F	UHF Ant., RF, Mixer & Osc. Coils	0Ω						Channels 53-58, includes capacitors
G	UHF Ant., RF, Mixer & Osc. Coils	0Ω						Channels 59-83, includes capacitors
L4	IF Trap	.2Ω		77626				
L5	Mod. Coil	0Ω		77627				
L6	RF Choke	1.4Ω		77695				
L7	RF Choke	1.4Ω		77695				
L8	Fil. Choke	0Ω		77631				
L9	Fil. Choke	0Ω		77632				
L10	Cathode Choke	0Ω		77629				
L11	RF Choke	0Ω		78224				
L12	IF Input Transformers	.1Ω	.1Ω	77809				
L13	IF Coupling Transformers-Primary	0Ω						
L14	IF Coupling Transformers-Secondary	0Ω						
L15	1st. Video IF	.3Ω	.3Ω	78100				Includes 330Ω resistor
L16	2nd. Video IF Grid	.3Ω	.4Ω	78987	17-4518 ⑤			Includes coupling coil, 41.25MC trap and caps. 1 Microhenry
L17	Fil. Choke	0Ω		73477	19-3001	TV-189	4604	
L18	2nd. Video IF Plate	.1Ω		78986	17-4519		6217	Includes 40 7MC trap, 9.2Ω resistor, and 100MMF & 10MMF caps.
L19	3rd. Video IF Grid	.4Ω		78989	17-4520		6218	Includes 47.25MC trap and 8MMF cap.
L20	RF Choke	1Ω		78945	19-1003		4608	2.2 Microhenries
L21	Fil. Choke	0Ω		73477	19-3001	TV-189	4604	1 Microhenry
L22	4th Video IF	.1Ω	.1Ω	78990	17-4523		6219	
L23	Fil. Choke	0Ω		73477	19-3001	TV-189	4604	1 Microhenry
L24	5th. Video IF	.1Ω	.1Ω	78991	17-4523		6219	
L25	Fil. Choke	0Ω		73477	19-3001	TV-189	4604	1 Microhenry
L26	6th. Video IF	.1Ω	.1Ω	78993	17-4523		6219	
L27	7th. Video IF	.1Ω	.1Ω	78995	17-4504		6218	Includes 47.25MC trap
L28	Shunt Peaking Coil	9Ω		74314	19-3180	TV-184	6180	150 Microhenries

MISCELLANEOUS ADJUSTMENTS (cont.)

COLOR PURITY ADJUSTMENT (Cont)

Adjust the eight magnets on the field equalizing assembly for the best overall white field over the entire picture tube screen. Adjustment of the magnets will have the most effect near the edges of the screen.

Remove the dot generator from antenna terminals and tune in a black and white picture, preferably a test pattern. Adjust the brightness and contrast control for a normal picture.

Adjust the blue and green video gain controls for a normal black and white picture with minimum overall color cast. Do not try to eliminate any localized color fringing in the picture with the video gain controls.

Adjust the brightness control for a dark picture on the screen. Adjust the blue and green background controls for a uniform black and white picture free of any color cast. Adjust the brightness controls over its brightness viewing range. The picture on the screen should be black and white over the brightness controls full viewing range, if necessary repeat adjustment of the video gain and background controls until this condition is achieved.

VERTICAL DYNAMIC CONVERGENCE ADJUSTMENTS

Recheck "Preliminary Convergence Adjustment" for correct setting of the three converging magnet and the blue beam positioning magnet to produce a white dot near center of the screen (using white dot generator).

Connect the RF output of a color dot generator across antenna terminals, adjust for color dots on screen of picture tube. Refer only to a vertical row of dots near the center of the screen. Adjust the red vertical amplitude control maximum clockwise. Adjust the red vertical tilt control for maximum displacement of the red dots near the center of the screen from the cyan dots. Adjust the green vertical amplitude control maximum clockwise and adjust the green vertical tilt control for maximum displacement of the green dots, opposite to red.

Connect a clip lead from blue grid of picture tube to chassis. (Terminals are provided to ground blue, green and red grids at rear on top of chassis). Adjust the green and red vertical tilt and vertical amplitude controls for straight vertical rows of the green and red dots equally displaced . Adjust the green and red convergence magnets (small magnets mounted on a knurled nut in a horizontal position) for convergence of the green and red vertical rows of dots. Note: Convergence magnets have correct color (red, green and blue) painted near the adjustments. If necessary, readjust green and red vertical tilt and amplitude controls to produce a single vertical row of (yellow) dots from top to bottom of screen. Remove clip lead from blue grid lead and chassis. Adjust the blue vertical amplitude control maximum clockwise. Adjust the blue vertical tilt and blue vertical amplitude controls alternately until the displacement of the blue dots are uniform with respect to the yellow dots in a vertical line.

Adjust the blue beam positioning magnet and the blue convergence magnet to converge vertically on the row of yellow dots. There should be one single row of dots (white) vertically from top to bottom of screen. If necessary, repeat above adjustments of vertical convergence.

HORIZONTAL DYNAMIC CONVERGENCE ADJUSTMENTS

Connect color dot generator as under "Vertical Dynamic Convergence". Use a horizontal row of dots near center of screen as reference. Adjust the blue horizontal amplitude control maximum clockwise. Adjust the blue horizontal phasing trimmer for the maximum downward displacement of the blue dots. Adjust the blue horizontal amplitude control and blue horizontal phasing trimmer alternately for a straight horizontal line across the screen, downward from the green and red dots. See Fig. 22 for correct dot movement.

Connect a clip lead from red grid lead to chassis. Adjust the green horizontal amplitude control and green horizontal phasing trimmer to provide a uniform displacement of the horizontal green dots with respect to the blue dots.

Remove the clip lead from the red grid lead and connect it to the blue grid lead and chassis.

Adjust the red horizontal amplitude control and red horizontal phasing trimmer to provide a uniform displacement of the horizontal red dots with respect to the green dots.

Adjust the red and green convergence magnet adjustments for convergence of the red and green dots horizontally near center line of screen. There should now be a single horizontal row of yellow dots near center of screen. Remove clip lead from blue grid lead and chassis. Adjust the blue convergence magnet and the blue beam positioning magnet (over blue gun near picture tube socket) to converge horizontally on the row of horizontal yellow dot, providing white dots. The vertical and horizontal dots should now show maximum coverage over the entire picture tube screen, providing white dots. Repeat, if necessary, adjustments under "Horizontal and Vertical Dynamic Convergence Adjustments" until maximum convergence is obtained.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C121	330	500	76476				
C122	.01	600	73594				
C123	12		33380	TCN-12	N750K-120		
C124	1000	500	39652			MCE255	
C125	.01	600	73594	D6-103	GP2-333-103	PT611	
C126	.22	400	73794			PT4022	
C127	.001	600	75643	D6-102	GP2L-102	PT621	
C128	.1	400	78922	DF-104		PT401	
C129	.18	400	79041				
C130	.22	600	74957			PT6022	
C131	1000	10000	79646				
C132	.01	6000	78918				
C133	1200	15000	79647				
C134	2500	30000	79643				
C135	.0033	400	79315	D6-332	GP2-333-332	PT6233	
C136	56	3500		DD60-560			
C137	270	3500	100104	DD60-271			
C138	270	3500	100104	DD60-271			
C139	150			DD60-151	6KV-151		
C140	1200	500	39654				
C141	.1	400	73551	DF-104		PT401	
C142	10000		73960	DD-103	811-01	DC-511	
C143	47		78913	D6-470	GP1K-470	UC-5447	
C144	.01	400	73561	D6-103	GP2-333-103	PT411	
C145	100			D6-101	GP1K-101	UC-531	
C146	.047	400	78921	DF-503		PT4147	
C147	270	500	39638	TCZ-271	NP0-333-271	MCB241	
C148	15		79993	TCZ-15	NP0K-150	ZT-5415	
C149	2000	500	39659			MCE457	
C150	10000		73960	DD-103	811-01	DC-511	
C151	10000		73960	DD-103	811-01	DC-511	
C152	.01	400	73561	D6-103	GP2-333-103	PT411	
C153	2200	500	78901				Note 2
C154	2200	500	78901				Note 2
C155	10000		73960	DD-103	811-01	DC-511	
C156	.1	600	73551	DF-104		PT601	
C157	.01	400	73561	D6-103	GP2-333-103	PT411	
C158	.22	200	78905			PT4022	
C159	2		79992	TCZ-2R2	NP0A-2R2		
C160	10000		73960	DD-103	811-01	DC-511	
C161	10000		73960	DD-103	811-01	DC-511	
C162	10000		73960	DD-103	811-01	DC-511	
C163	10000		73960	DD-103	811-01	DC-511	
C164	2		79992	TCZ-2R2	NP0A-2R2		
C165	10000		73960	DD-103	811-01	DC-511	
C166	10000		73960	DD-103	811-01	DC-511	
C167	10000		73960	DD-103	811-01	DC-511	
C168	33		70596	TCZ-33	NP0K-330	ZT-5433	
C169	150		79991	TCZ-150	NP0-333-151	ZT-5315	
C170	22		33101	D6-220	GP1K-220	UC-5422	
C171	10000		73960	DD-103	811-01	DC-511	
C172	.1	400	73551	DF-104		PT401	
C173	24		78915	TCN-24	N750K-240		
C174	10000		73960	DD-103	811-01	DC-511	
C175	100		39396	TCZ-100	NP0L-101	ZT-541	
C176	4		78912				
C177	.047	400	78921	DF-503		PT4147	
C178	18		39041	D6-180	GP1K-180	UC-5418	
C179	.1	400	73551	DF-104		PT401	
C180	9		78914				
C181	.1	400	78922	DF-104		PT401	
C182	470	500	76992			MCE245	
C183	.1	400	78922	DF-104		PT401	
C184	.047	400	78921	DF-503		PT4147	
C185	.1	400	73551	DF-104		PT401	
C186	.1	400	78922	DF-104		PT401	
C187	470	500	76992			MCE245	
C188	.1	400	78922	DF-104		PT401	
C189	.047	400	78921	DF-503		PT4147	
C190	.1	400	73551	DF-104		PT401	
C191	.1	400	78922	DF-104		PT401	
C192	470	500	76992			MCE245	
C193	.1	400	78922	DF-104		PT401	
C194	.047	400	78921	DF-503		PT4147	
C195	.1	400	73551	DF-104		PT401	
C196	.01	1600	73822	DD16-103		PT1611	
C197	.1	600	73557	DF-104		PT601	
C198	.1	600	73557	DF-104		PT601	
C199	.1	600	73557	DF-104		PT601	
C200	820		78944	DD-801	831-801	DC-521	
C201	820		78944	DD-801	831-801	DC-521	
C202	.047	600	73592	D6-503		PT6147	
C203	.047	600	73592	D6-503		PT6147	
C204	1000	500	39652			MCE255	
C205	1000	500	39652			MCE255	
C206	1000	500	39652			MCE255	
C207	.22	200	73794			PT4022	
C208	.22	200	73794			PT4022	
C209	.068	200	79016				

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

Note 2. C153 and C154 are matched pair.

♦ Items C105A, C105B, C105C, C105D, R137A, R137B, R137C and R137D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	5000Ω	2	78940	*QJ-555			WF53 }	Brightness-Panel (Wire-Wound)
B	1Meg	½					UR16-T25 }†	Volume tapped at 180K-Rear
C	Switch						US-26	Attach to R1B.
R2	10KΩ	½	78949					Green Video Gain
R3A	1500Ω	½	79622	Q11-109	A47-1500-S	AB-6	U5L	Contrast
B	Shaft		Not Req.	Not Req.	RS-5	AK-25	DS-36	Attach to R3A.
C	Coupler		Not Req.	C3	Not Req.	AK-16	Not Req.	Attach to R3A.

ALIGNMENT INSTRUCTIONS (cont)

VIDEO IF ALIGNMENT (Cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	"	"	44MC (10MC Swp)	41.25MC 41.65MC 45.75MC	"	Vert. Amp. thru detector (detector lead of Pin. 5) to pin 5 (plate) of 6DC8 (V4). Low side to chassis. (Do not use scope pre-amp.)	A16, A17	Couple marker generator loosely to pin 1 (grid) of 6DC8 (V4). Connect the load leads of IF test block (Fig. 5) to pin 5 (plate) of 5 (6DC8) and V6 (6DC6). Attenuate generator output for .3 volt peak to peak on scope. Adjust A16 and A17 for maximum gain with response similar to Fig. 7. While observing response on scope, adjust the sound level control (R12) for maximum rejection at 41.25MC.
13.	Fig. 4	Thru input head (Fig. 4) to front terminal of K3E crystal and chassis.	Not used	40.7MC (400%Mod)	Any non-interfering channel	Vert. Amp. thru detector (detector lead of Fig. 5) to pin 5 (plate) of 6DC8 (V5). Low side to chassis.	A15	Connect the load leads of the IF test block (Fig. 5) to pin 5 (plate) of 6DC8 (V5) and pin 5 (plate) of 6AN8 (V7). Connect the ungrounded side of C55 to chassis. Adjust for MINIMUM 400% response on scope.
14.	"	"	"	47.25MC (400%Mod)	"	"	A19	Adjust for MINIMUM 400% response on scope. Remove jumper from ungrounded side of C55 to chassis.
15.	"	"	44MC (10MC Swp)	40.7MC 41.65MC 45.75MC 47.25MC	"	Vert. Amp. thru detector (detector lead of Fig. 5) to pin 5 (plate) of 6DC8 (V5). Low side to chassis. (Do not use preamp.)	A20, A21	Connect the potentiometer arm of the 15 volt bias supply to the ungrounded side of C55. Connect the positive side to chassis. Adjust the potentiometer arm for -8 volts at C55. Connect a jumper from the junction of R90 and R91 to chassis. Couple the signal generator loosely to pin 1 (grid) of 6DC8 (V4). Adjust for response similar to Fig. 8.
16.	Fig. 9 & Fig. 4	Signal generator in series with sound attenuator pad thru input head (Fig. 4) to front terminal of K3E crystal and chassis.	Not used	43.0MC (400%Mod)	"	Vert. Amp. thru detector (detector lead of Fig. 5) to pin 5 (plate) of 6DC8 (V5). Low side to chassis. (Use preamp. if necessary).		Note and mark output level of response on scope. This output level of response on scope. This output level is to be used as reference in step 18.
17.	Fig. 4	Thru input head (Fig. 4) to front terminal of K3E crystal and chassis.	"	41.25MC (400%Mod)	"	"	A15	Readjust A15 for MINIMUM response.
18.	Fig. 4	Thru input head (Fig. 4) to front terminal of K3E crystal and chassis.	Not used	43.0MC (400%Mod)	Any non-interfering channel	Vert. Amp. thru detector (detector lead to Fig. 5) to pin 5 (plate) of 6DC8 (V5). Low side to chassis. (Use pre-amp. if necessary).		Turn sound level control (R12) counter clockwise from position set in step 13) until output level indication on scope is same as obtained in step 16. Remove IF test block (Fig. 5) and scope.

OVERALL VIDEO IF RESPONSE CHECK

Connect the potentiometer arm of the 15 volt bias supply to the ungrounded side of C55. Connect the positive side to chassis. Adjust for -9 volts at C55. Couple the marker generator loosely to the grid of the second video IF amplifier tube (V4).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Fig. 4	Thru input head (Fig. 4) to front terminal of K3E crystal and chassis.	43MC (10MC Swp)	41.25MC 41.65MC 45.0MC 45.75MC 46.5MC	Any non-interfering channel	Vert. Amp. to point ⊕. Common to chassis.		Attenuate sweep generator output for 6 volt peak to peak on scope. Check for response curve similar to Fig. 10. If necessary, retouch A10, A11 and A13 to obtain desired response. Exercise care to obtain marker response exactly as shown in Fig. 10.

KRK12C VHF TUNER ALIGNMENT

In step 20 choose the proper pad (See Fig. 11) to match the output impedance of the sweep generator to be used. If the sweep generator does not have built-in markers, couple a VHF signal generator loosely to antenna terminals to provide markers.
Connect the negative lead of the 7.5 volt bias supply to the tuner AGC terminal. Connect the positive side to chassis. Adjust the potentiometer arm for -3 volts at tuner AGC terminal. To minimize RF-IF interaction remove the RF oscillator tube (V2/6AF4) from its socket.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	Fig. 11	Thru attenuator pad (Fig. 11) to VHF antenna terminals.	87MC (20MC Swp)	55.25MC 59.75MC	2	Vert. Amp. to point ⊕. Low side to tuner chassis. (Use preamp. if necessary)	A23, A33, A24, A25 (see remarks	Adjust for symmetrical response with maximum gain of tuner bandpass as in Fig. 13 (The curves will have a deep valley due to crystal loading and non-linear detector characteristics). Do not exceed limits shown in Figs 12A and 12C. Each channel strip adjustment for an individual channel strip has a corresponding adjustment on all other channel strips. Since these adjustments are identical in position and function they are indicated by same "A" number in the interest of simplification. Adjustments A22, A23 and A24 are accessible thru holes in the top of the tuner as the channel switch is turned to each channel. Adjustment A25 refers to coupling capacitor whose positioning affects bandwidth of response curve. Note: The valley in the response curve (Fig. 12B) may vary from 0-50% (lower dashed curve). If the valley rises above 50% (upper dashed curve) this is an indication of excessive sweep generator output and the sweep generator output should be attenuated. Oscillator injection voltage is adjusted on UHF channel inserts only. Remove test equipment and replace oscillator tube (V2) in its socket.
			63MC (20MC Swp)	61.25MC 65.75MC	3			
			89MC (20MC Swp)	67.25MC 71.75MC	4			
			79MC (20MC Swp)	77.25MC 81.75MC	5			
			85MC (20MC Swp)	83.25MC 87.75MC	6			
			177MC (20MC Swp)	175.25MC 179.75MC	7			
			183MC (20MC Swp)	181.25MC 185.75MC	8			
			189MC (20MC Swp)	187.25MC 191.75MC	9			
			195MC (20MC Swp)	193.25MC 197.75MC	10			
			201MC (20MC Swp)	199.25MC 203.75MC	11			
			207MC (20MC Swp)	205.25MC 209.75MC	12			
			213MC (20MC Swp)	211.25MC 215.75MC	13			
21.	Connect the potentiometer arm of the 15 volt bias supply to the ungrounded side of C55. Connect the positive side to chassis. Adjust potentiometer arm for -9 volts at C55. Use only enough sweep generator output to provide usable response curve on scope. Set the fine tuning control to its mid-range position. Connection for the heterodyne meter is made as follows: Insert the end of an insulated piece of wire into either of two holes next to the oscillator tube at the right top front corner of the tuner. Use care so that the wire does not touch any tuned circuits. Connect other end of wire to RF input of frequency meter.							

FIG. 1 FIG. 2

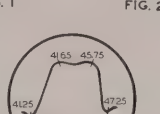


FIG. 3

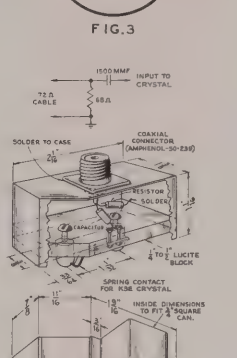


FIG. 4

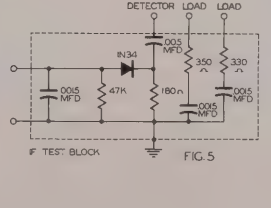


FIG. 5

KRK12C VHF TUNER ALIGNMENT (Cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.		Connect frequency meter as in step 21.	Not used	Freq. meter to 257MC	13	Not used	A26	Adjust audible beat on freq. meter.
23.	Fig. 11	Thru attenuator pad (Fig. 11) to VHF antenna terminals.	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point ⊕. Low side to chassis.	A27, A34	Adjust A27 for maximum gain on scope. Adjust A26 for maximum gain and flat-topped curve. Recheck A27 for maximum gain at center of band with flat-topped response.
24.		Connect frequency meter as in step 21.	Not used	Freq. meter to 251MC	12	Not used	A26, A24	Adjust A26 on each channel for audible beat. Connect sweep generator and scope as in step 23. Set sweep generator and marker to proper frequencies (see chart) for each channel and adjust A34 if necessary for maximum gain and proper response. Do not readjust A27.
				245MC	11			
				239MC	10			
				233MC	9			
				227MC	8			
				221MC	7			
				129MC	6			
				123MC	5			
				113MC	4			
				107MC	3			
				101MC	2			
25.	Direct	High side to point ⊕. Low side to chassis.	"	43.5MC (400%Mod)	Any	Vert. Amp. to point ⊕. Low side to chassis	A28	Adjust for MINIMUM 400% indication on scope. Remove test equipment.

KRK12C UHF TUNER ALIGNMENT

Alignment of the UHF portion of the tuner should not be attempted unless the following test equipment is available, in addition to the usual VHF test equipment: UHF sweep generator covering the frequency range of 470MC to 890MC. A marker generator, of crystal accuracy, covering the same frequency range.
Remove the RF Oscillator tube (V2/6AF4) from its socket.
Connect the potentiometer arm of the 15 volt bias supply to the ungrounded side of C55. Connect the positive lead to chassis. Adjust the potentiometer arm for -9 volts at C55.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.
If strong interference is encountered from an FM station adjust the FM trap to minimize this interference. This trap is fastened to the transmission line inside the receiver cabinet on the tuner.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
26.	300Ω Attenuator Pad	Thru attenuator pad to UHF antenna terminals. Connect UHF marker generator loosely to UHF antenna terminals.	Set sweep to cover channel being aligned (See chart) Use 30MC sweep width	Set to video and sound freq. of channel being aligned (see chart)	14 thru 83	Vert. Amp. to point ⊕. Low side to tuner chassis. (Use pre-amp. if necessary)	A29, A33, A34	Adjust A29, A33 and A34 for response similar to Fig. 13 for all UHF channel strip inserts. Remove test equipment and replace the 6AF4 (V2) in its socket.
27.	"	"	"	Set to video carrier freq. of channel being aligned.	14 thru 83	Vert. Amp. to point ⊕. Low side to chassis.	A36	Attenuate sweep generator for 6 volts peak to peak on scope. Set fine tuning control to its mid-range position. Connect VHF generator to point ⊕ using very short leads. Set generator frequency to 45.75MC. Adjust A36 for channel strip being aligned until 45.75MC and video carrier marker coincides on response curve as in Fig. 14. Adjust A24 of channel strip being aligned for maximum gain with proper waveshape. Connect the DC probe of VTVM to point ⊕. Common to chassis. Set the oscillator injection adjustment for reading on VTVM between 0.1 volt and 0.3 volt on all UHF channels. Remove all test equipment.

VIDEO TRAP ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
28.	.01MFD	High side to pin 2 (grid) of 6CL6 (V9). Low side to chassis.	Not used	4.5MC (400%Mod)	Any	Vert. Amp. thru detector (detector lead of Fig. 5) to point ⊕. Low side to chassis.	A30	Ground pin 2 (grid) of 6CL6 (V9). Short the ungrounded side of C156 (in plate circuit of V7B) to chassis. Turn color saturation control fully clockwise. Adjust A30 for MINIMUM 400% response on scope. Remove jumpers from pin 2 of V8 and C156.
29.	This step requires the use of a 100% saturated color bar generator (If this is not available use the alternate method given in step 30). Connect the vertical amplifier of a wide band oscilloscope to red grid (pin 2) of the picture tube. Connect the high side of the color bar generator to pin 2 (grid) of 6CL6 (V9). Low side to chassis. Adjust A31 for MINIMUM color sub-carrier indication in the video signal.							
30.	.1MFD	High side to pin 2 (grid) of 6CL6 (V9). Low side to chassis.	2.5MC (3MC Swp)	1.5MC 3MC 3.58MC	Any	Vert. Amp. thru detector (detector lead of Fig. 5) to point ⊕. Low side to chassis.	A31	To prevent noise from second detector appearing on scope connect pin 2 (grid) of 6CL6 (V9) to chassis. Turn contrast control maximum clockwise. Check for response similar to Fig. 15. Increase sweep output so that the 3.58MC portion of trace is raised above the scope base line. Adjust A31 for MINIMUM marker amplitude.

RESPONSE CHECK VIDEO CIRCUIT

These circuits are not adjustable. The response check is made to determine if the circuits are operating properly.
Leave the sweep generator connected as in step 30.
Remove the 3.58MC crystal (M15). Turn the color saturation control (R8A) to its maximum counter clockwise position. Connect the scope thru detector (Fig. 5) to each picture tube grids (2, 12 and 6). Check for response similar to Fig. 16 at each picture tube grid. Attenuate sweep generator output to prevent overload.

RESPONSE CHECK OF "R-Y" AND "Q" CHANNELS

Connect a short clip lead from pin 2 (grid) of V8 to chassis.
These circuits are not adjustable. The response check is made to determine if the circuits are operating satisfactorily. Connect the scope through the detector (Fig. 5) to Point ⊗. Low side to chassis. Connect the high side of sweep generator thru .1MFD to pin 1 (grid of 6BY6 (V3A). Low side to chassis. Turn the color saturation control (R8A) maximum clockwise. Check for response similar to Fig. 17A. Move sweep generator to pin 1 (grid) of 6BY6 (V3C). Connect the vertical amplifier of scope through detector (Fig. 5) to point ⊗. Check for response similar to Fig. 17B. Remove test equipment and replace the 3.58MC crystal (M15). Remove short from pin 2 (grid) of V8.

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PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L29	4.5MC Trap	.4ΩCT		78897	17-3402		1469	
L30	3.58MC Trap	2.8Ω		78892	17-6016 ♦		1469	
L31	Chroma Sync Take-off	2.8Ω		78892			1470	
L32	Shunt Peaking Coil	6Ω		71527	19-3093	TV-181	6177	93 Microhenries
L33	Shunt Peaking Coil	11Ω		71526	19-3250	TV-185	6181	250 Microhenries
L34	Series Peaking Coil	11Ω		71526	19-3250	TV-185	6181	250 Microhenries
L35	2nd. Sound IF	6Ω	3.5Ω	78996	17-1021 *	TV-108 *	1466 *	
L36	Ratio Det.	9.5Ω	.9ΩCT	76929	17-1033	TV-110	1468	Tertiary winding-.3Ω
L37	Horiz. Osc.	115Ω		75213	20-1402 ■	TV-162 ■	6183 ■	Primary tapped @85Ω Horiz. Waveform winding -37Ω
L38	Bandpass Primary Coil	7.5Ω		78887	17-6010			Primary tapped @2.5Ω tertiary winding-6Ω
L39	Bandpass Secondary Coil	1.5Ω		78888	17-6011			
L40	Burst Amp. Trans.	2.5Ω	1.5ΩCT	78886	17-6012			
L41	Series Peaking Coil	2.4Ω		72618	19-6022		6152	20 Microhenries
L42	Reactance Coil	5.5Ω		78891	17-6015			
L43	Chroma Reference Osc. Coil	.4ΩCT		78889	17-6013			
L44	Quadrature Trans.	6Ω	.5Ω	79623				Includes 2 - 680Ω resistors, & 2 - 1500 MMF capacitors Tertiary winding -.5Ω
L45	Series Peaking Coil	130Ω		78902	19-5102		4670	6.7 Microhenries
L46	Shunt Peaking Coil	24Ω		78903	19-5101		4664	1.9 Microhenries
L47	Delay Filter	31ΩCT		78890				
L48	Series Peaking Coil	26Ω		79185			4652	1 Microhenry
L49	Series Peaking Coil	26Ω		79185			4652	1 Microhenry
L50	Shunt Peaking Coil	11Ω		71526	19-3250	TV-185	6181	250 Microhenries
L51	Shunt Peaking Coil	11Ω		71526	19-3250	TV-185	6181	250 Microhenries
L52	Shunt Peaking Coil	11Ω		71526	19-3250	TV-185	6181	250 Microhenries
L53	Series Peaking Coil	7Ω		75253	19-3125		6153	120 Microhenries
L54	Series Peaking Coil	7Ω		75253	19-3125		6153	120 Microhenries
L55	Series Peaking Coil	7Ω		75253	19-3125		6153	120 Microhenries

* Drill one new mounting hole.
■ Reverse coil mounting in can.
▲ Detune trap.
♦ Two coils required - 2nd. coil part #17-6017.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L56	.695ADC	11.2Ω	.64HY	79974					

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: RCA Victor PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.695ADC	78894	1267A			9A2	759	
M2	.695ADC	78894	1267A			9A2	759	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: RCA Victor PART No. FUSE	RCA Victor PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG P/T	3/10A 250V	77935				GJV 3/10	
M4	3AG P/T	4.5A 250V	79357				MTH5	
M5	3AG	1/2A 250V	78798	79641	312.500 (3AG 1/2A)	357001	AGC 1/2	4405
M6	#26 AWG Wire		79358					
M7	#26 AWG Wire		79358					

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage should be disabled by removing the fuse (M5) in series with pin 7 of the deflection yoke socket. Allow time for test equipment & receiver to warm up.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Ground pin 2 (grid) of 6CL6 (V8).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection. Attenuate generator output for -12 volts on VTVM for final peaking of A1 thru A4.
2.	"	"	"	"	DC probe to point (C). Common to chassis.	A5	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Move VTVM to point (A) and retouch A4 for maximum deflection and then repeat step 2.
3.	"	"	"	"	DC probe to point (A). Common to chassis.		Connect a 1500Ω resistor across terminals "C" and "B" (primary) of L35. Readjust A3 for maximum deflection. Disconnect the 1500Ω resistor and reconnect it across terminals "A" and "D" of L35 and adjust A2 for maximum deflection. Remove the 1500Ω resistor and the jumper from pin 2 of V8 to ground.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Ground pin 2 (grid) of 6CL6 (V8).
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (A). Low side to chassis.	A1, A2, A3, A4	Disconnect stabilizing capacitor C7. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A5	Reconnect stabilizing capacitor (C7). Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 2. SLIGHTLY retouch A4 for maximum amplitude and straightness of crossover lines. Remove jumper from pin 2 of V8. Continue alignment with step 4.

VIDEO IF ALIGNMENT

If a scope to be used does not have a sensitivity of .1 millivolt per inch a suitable preamplifier may be necessary. A VHF signal generator of crystal accuracy should be used to provide markers. Beginning with step 7 the sweep or signal generators will be connected to the front terminal of the K3E crystal mixer (M8). Since extremely short leads must be used in making these connections it is recommended that the KRK 12C input head shown in Fig. 4 should be constructed and used in order to obtain reliable response curves.
Three 7.5 volt batteries capable of withstanding considerable current drain are required.
Connect two 7.5 volt batteries in series with a 1000 potentiometer across the 15 volt combination. Also, connect a 1000Ω potentiometer across the third 7.5 volt battery. Connect the positive side of the 7.5 volt battery to chassis and the potentiometer arm to the ungrounded side of C55 and adjust for -6 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 6CL6 (V8). Low side to chassis.	Not used	47.25MC (400∿Mod)	Any	Vert. Amp. (thru preamplifier if necessary) to point (D). Low side to chassis.	A6	Connect pin 8 (grid) of 6AN8 (V7A) to chassis using a short jumper. Adjust for MINIMUM 400∿ indication on scope.
5.	"	"	"	41.25MC	"	"	A7	"
6.	Direct	High side to pin 2 (grid) of 6CL6 (V8). Low side to chassis. Use very short leads.	44MC (10MC Swp)	41.25MC 41.65MC 45.75MC 47.25MC	"	Vert. Amp. to point (D). Low side to chassis.	A8, A9	Adjust sweep generator output for 6 volts peak to peak on scope. Couple marker generator loosely to pin 2 of V8. Adjust A8 and A9 for maximum gain with response similar to Fig. 3. While observing response on scope, adjust the sound rejection control (R18) for maximum rejection at 41.25MC. Remove short from pin 8 of V7A to chassis.
7.	Fig. 4	Thru input head (Fig. 4) to front terminal of K3E crystal (M8) and chassis	Not used	44.9MC	Any non-interfering channel	Use VTVM. DC probe to point (D). Common to point (E).	A10	Connect the junction of R90 and R91 to chassis with a short jumper. Adjust for maximum deflection. Attenuate generator output to maintain -6 volts on VTVM.
8.	"	"	"	42.1MC	"	"	A-11	"
9.	"	"	"	41.3MC	"	"	A12	Adjust for maximum deflection. Attenuate generator output for -6 volts on VTVM. Remove test equipment and 7.5 volts bias supply.
10.	Fig. 4	Thru input head (Fig. 4) to front terminal of K3E crystal (M8) and chassis	43MC (20MC Swp)	41.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (detector lead of Fig. 5) to point (F). Low side to chassis.	A13, A14	Connect a 56Ω carbon resistor between terminals "C" and "B" of L15 (on tuner). Couple marker generator loosely to pin 3 (grid) of 6U8 (V3). Attenuate sweep generator output for .3 volts peak to peak on scope. Adjust A13 and A14 for maximum gain with response similar to Fig. 6. Remove 56Ω resistor from L15.
11.	"	"	Not used	41.25MC (400∿Mod)	"	Vert. Amp. thru detector (detector lead of Fig. 5) to pin 5 (plate) of 6DC6 (V4). Low side to chassis. (Use scope preamp. if necessary.)	A15	Connect the load resistor of IF test block (Fig. 5) to pin 5 (plate) of V5 (6DC6) and V6 (6DC6). Connect the ungrounded side of C55 to chassis. Adjust A15 for MINIMUM 400∿ indication on scope. Remove jumper from ungrounded side of C55 to chassis.

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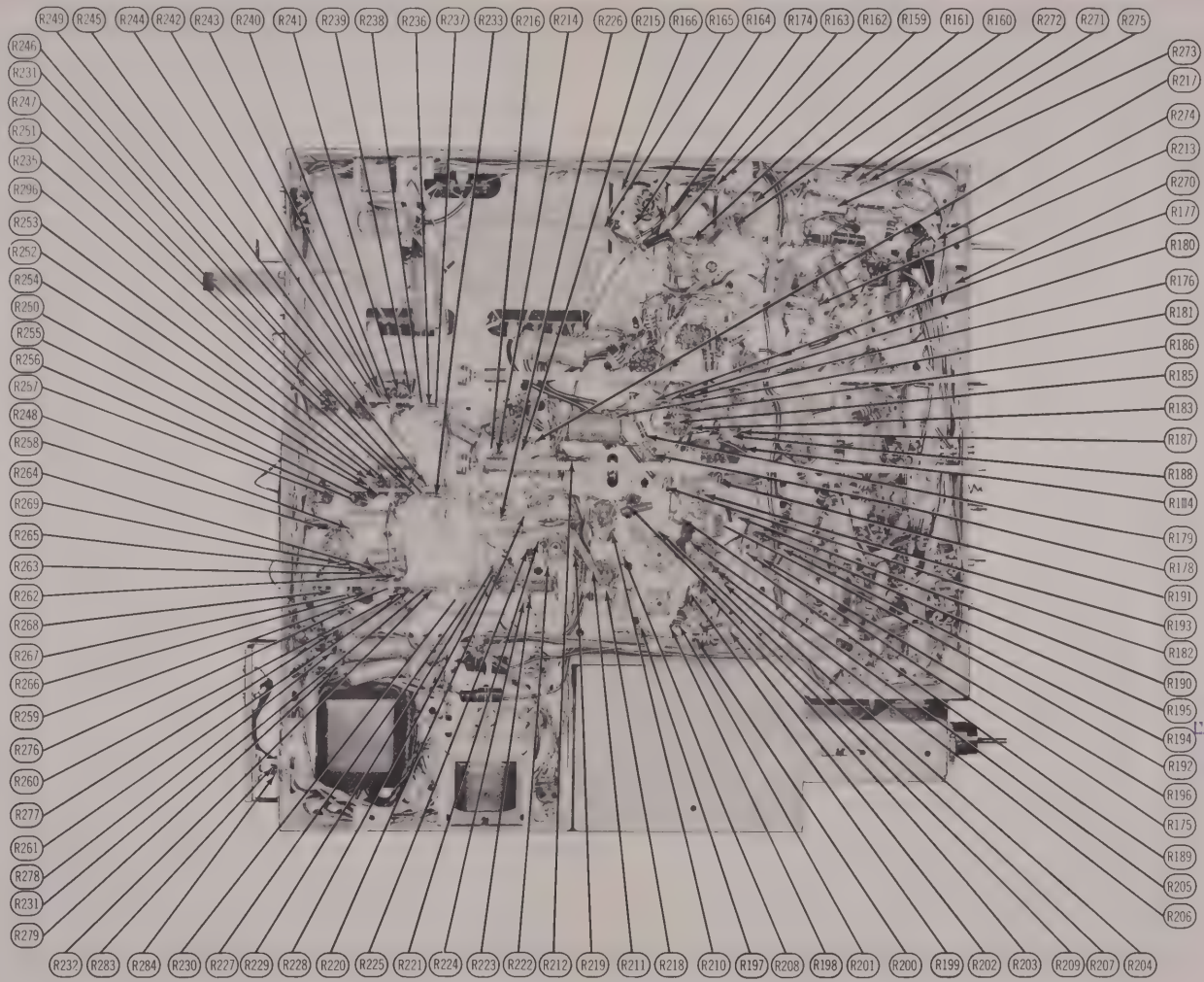

CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION (R159-R296)

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ALIGNMENT INSTRUCTIONS (cont)

FIRST VIDEO AMPLIFIER AND BANDPASS AMPLIFIER ALIGNMENT

Remove 6CL6 V8 from socket (or short pin 2 of V8 to chassis.
Turn contrast control and color saturation control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
31.	.1MFD	High side to pin 2 (grid) of 6CL6 (V9). Low side to chassis.	3MC (3MC Swp)	2.5MC 3.58MC 4.1MC	Any	Vert. Amp. thru detector (Fig. 5) to pin 1 (grid) of 6BY6 (V30). Low side to chassis.	A32, A33, A34	Adjust for maximum gain and response similar to Fig. 19. Remove test equipment and replace V8 (or remove short from pin 2 of V8) in its socket. Switch off receiver power and replace fuse (M5).

ALTERNATE FIRST VIDEO AMPLIFIER AND BANDPASS AMPLIFIER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Connect the potentiometer arm of the 7.5 volt bias supply to pin 5 or 6 (diode plates) of 6AV6 (V15). Connect the positive side to chassis. Adjust the potentiometer arm for −2 volts at pin 5 of V15. Connect the potentiometer arm of the 15 volt bias supply to the ungrounded side of C55. Connect the positive side to chassis. Adjust the potentiometer arm for -9 volts at C55. Connect a jumper across the terminals of the 4.5MC trap (L29).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
32.	Direct	Connect signal generator and video sweep modulator across antenna terminals. (See remarks)	3MC (3MC Swp)	67.25MC	4	Vert. Amp. thru detector (Fig. 5) to pin 1 (cathode) of 6CL6 (V9). Low side to chassis.		Signal generator should provide channel 4 video carrier frequency (67.25MC) with crystal accuracy. Connect DC probe of VTVM to point (D). Common to point (E). With zero video sweep modulation adjust signal generator output (67.25MC for 3 volts on VTVM) Remove VTVM and apply video sweep modulation, being careful not to overload. Couple VHF signal generator loosely to pin 1 (grid) of 6DC6 (V4) to provide 45.75MC marker. To set the local oscillator exactly on frequency, adjust fine tuning until a beat pattern is obtained on scope. Remove VHF generator from pin 1 of V4. Response on scope should be similar to Fig. 18.
33	"	"	"	"	"	Vert. Amp. thru detector (Fig. 5) to pin 2 (cathode) of 6BY6 (V30). Low side to chassis.	A32, A33, A34	Remove jumper across terminals of L29. Connect short jumper from point (M) to chassis. Turn contrast control fully clockwise. Adjust A32, A33 and A34 for maximum gain and response similar to Fig. 19. Remove test equipment. Switch off receiver power and replace fuse (M5). Remove jumper from point (M) to chassis.

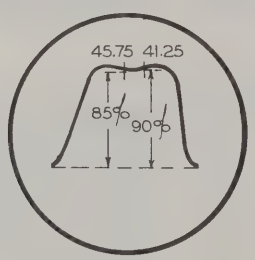


FIG.6

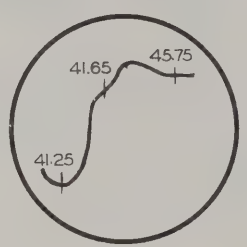


FIG.7

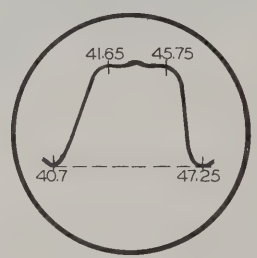
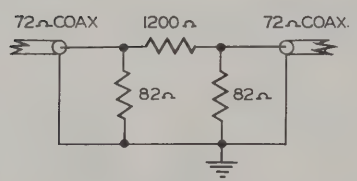


FIG. 8



SOUND ATTENATOR PAD
FIG. 9

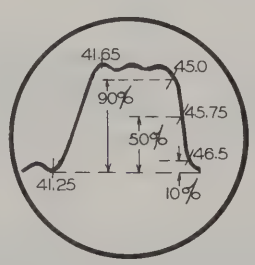


FIG. 10

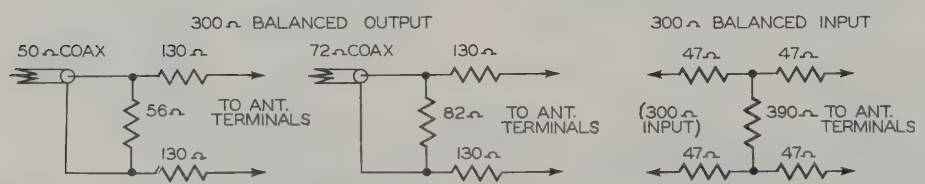


FIG. 11

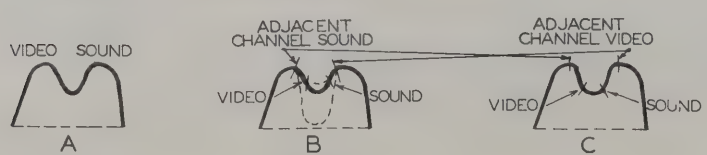
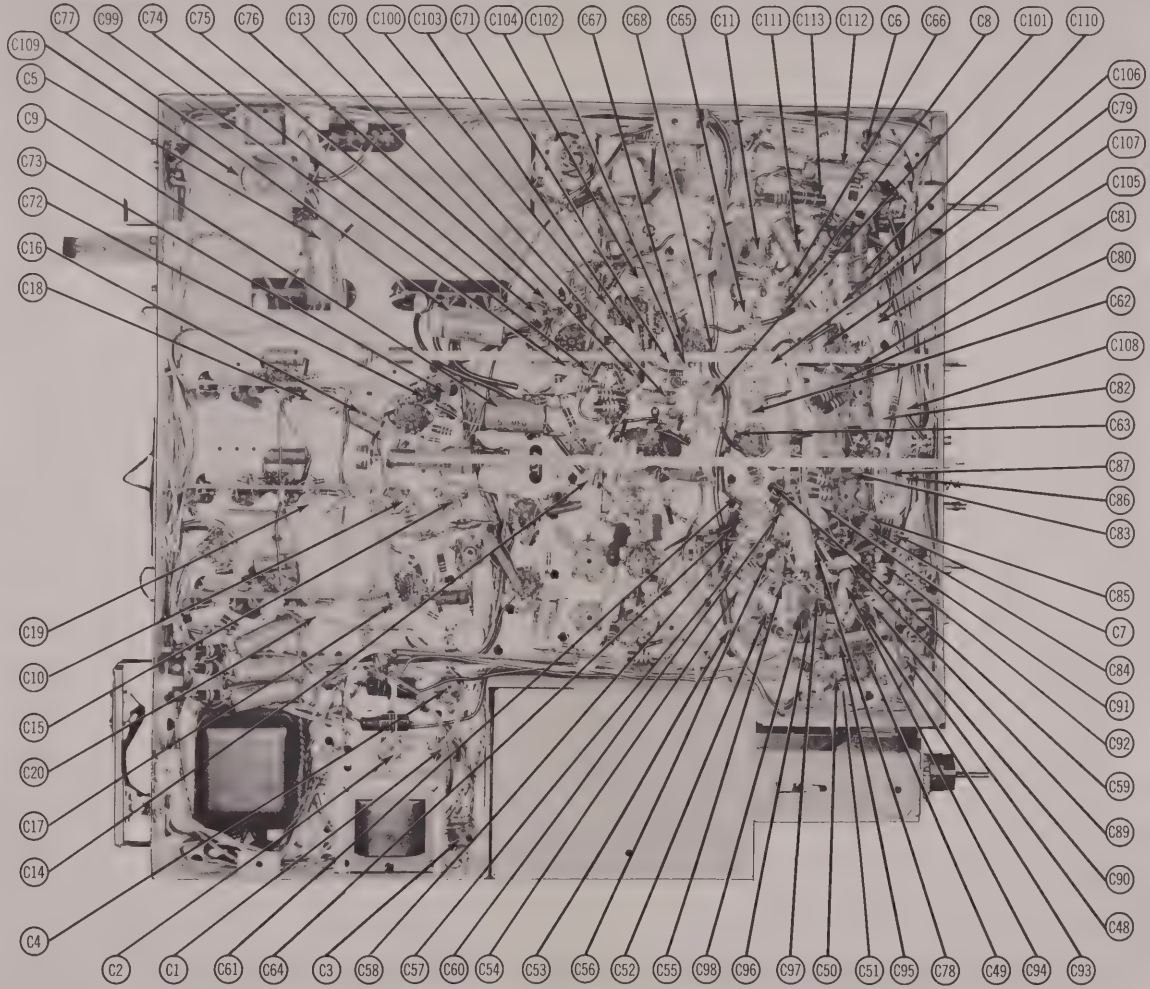
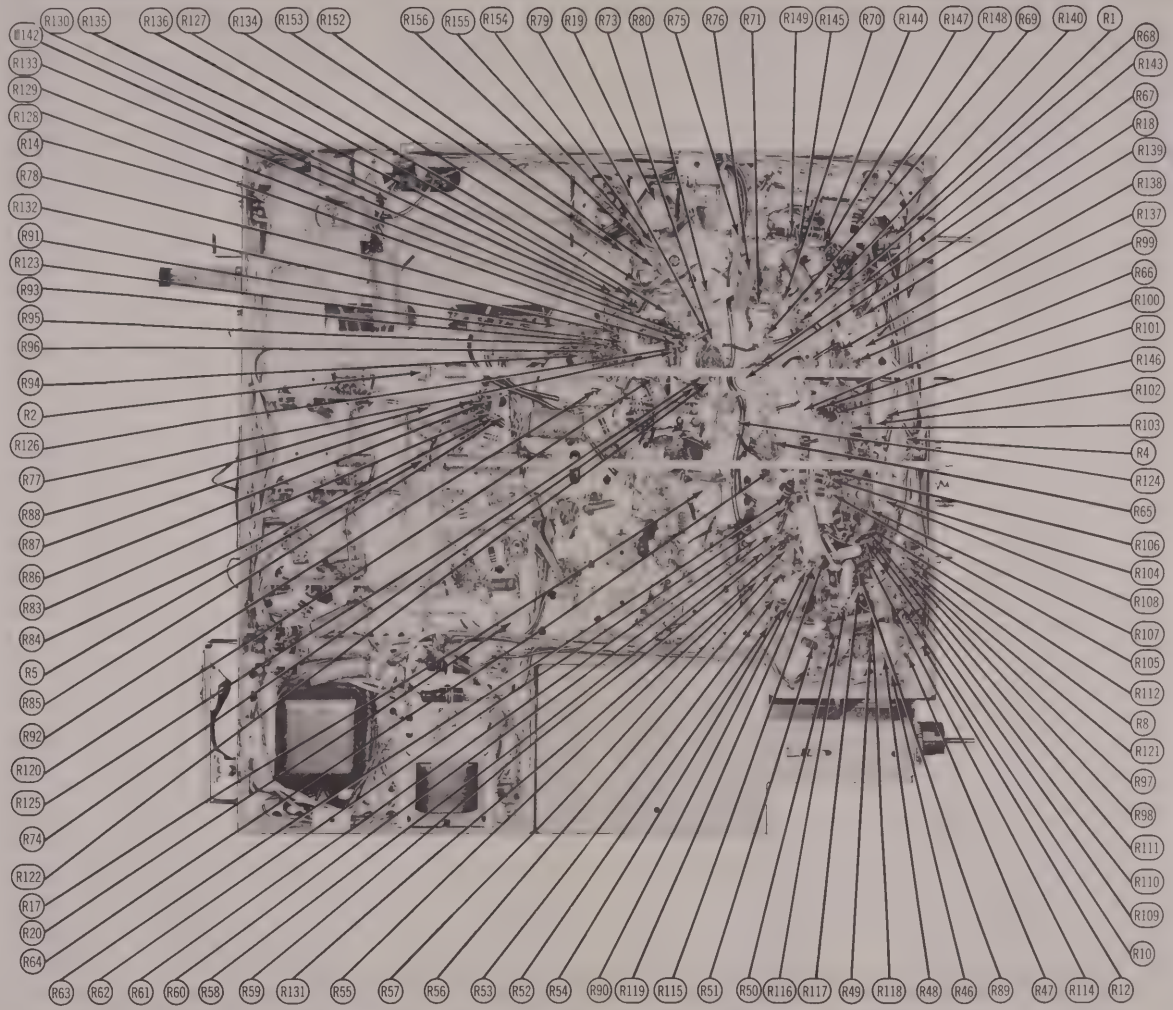


FIG. 12



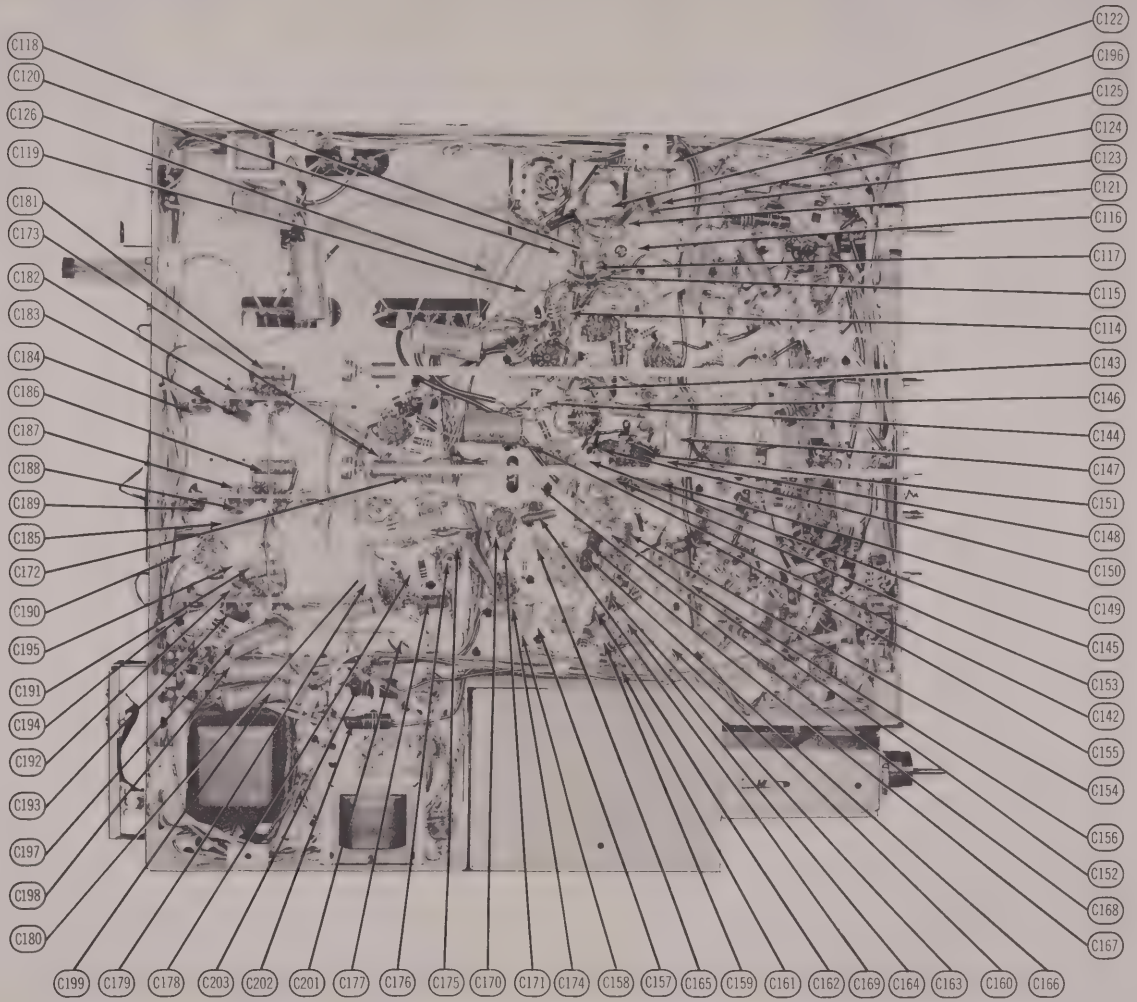
CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION (C1-C113)

PROPERTY OF



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION (R1 – R156)

DENVER, COLORADO



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION (C114-C203)

CONTROLS (cont)

ITEM No	RATING		REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	2.5Meg	1	79628	##J-656		FI-76	UF25SL †††	Height -Panel
B	500KΩ	1				R3-18	UR3SL	Vert. Linearity-Rear
R5	10KΩ	1	79949					Blue Video Gain
R6A	500Ω	1	79951	Q11-103	A47-500-S	B-4	U-3	Color Saturation
B	Shaft	1	Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R6A.
R7A	1Meg	1	79954	##J-652		FI-81	UF1SL †††	Horiz. Lock-Panel
B	50KΩ	1				R3-39	UR54L	Horiz. Hold-Rear
R8A	15KΩ	1	79958				WJ15J =	Red Screen-Panel(Wire-Wound)
B	500Ω	2					UR5SL	AGC-Rear
R9A	2.5Meg	1	79941	Q11-339	A47-2.5Meg-S	B-53	U-355	Tone
B	Shaft	1	Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R9A.
R10A	15KΩ	2	79959				UE789W	Green Screen-Panel(Wire-Wound)
B	15KΩ	2						Blue Screen-Rear(Wire-Wound)
R11A	10KΩ	3	79965				US705W	Green Background-Panel (Wire-Wound)
B	10KΩ	2						Blue Background-Rear (Wire-Wound)
R12	750Ω	1	79943					Sound Level
R13A	1.5Meg	1	79969	Q11-138	A47-1.5Meg-S	BX-743	U-155	High Voltage
B	Shaft	1	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R13A.
R14A	1500Ω	3	79948	WK-1500	A47-1500	VK-150	RU500L	Vert. Centering(Wire-Wound)
B	Shaft	1	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R14A.
R15A	100Ω	3	79960	W-100	A43-100	VK-131	M100PK	Horiz. Centering(Wire-Wound)
B	Shaft	1	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R15A.
R16	5Meg	1	79938					Focus
R17A	250KΩ	1	79963	Q11-130	A47-250K-S	AB-50	U-46	AFC-Balance
B	Shaft	1	Not Req.	Not Req.	FS-3	Not Req.	AK-4	Attach to R17A.
R18	750Ω	1	79933					Sound Reject
R19A	100KΩ	1	79956	Q11-138	A 7-100K-S	AB-60	U-41	Horiz. Drive
B	Shaft	1	Not Req.	Not Req.	FKS-3	Not Req.	AK-4	Attach to R19A.
R20A	500Ω	1	79961	Q11-103	A47-500-S	B-4	U-3	R-Y Gain
B	Shaft	1	Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R20A.
R21A	10KΩ	1	100007	##J-650		FI-35	UF1SR =	Red Horiz. Amp. -Panel
B	10KΩ	1	Not Req.			R3-35	UR1SR	Blue Horiz. Amp. -Rear
R22A	10KΩ	1	79959	Q17-116	A47-10K-V	AB-17	U-19	Green Horiz. Amp.
B	Shaft	1	Not Req.	Not Req.	FKS-3		AK-4	Attach to R22A.
R23A	500A	1	100006	##J-651		FI-1	UF2SL =	Blue Vert. Tilt-Panel
B	2500Ω	1				R3-13	UR2SL =	Blue Vert. Amp. -Rear
R24A	500Ω	1	100006	##J-651		FI-1	UF2SL =	Red Vert. Tilt-Panel
B	2500Ω	1				R3-13	UR2SL =	Red Vert. Amp. -Rear
R25A	500Ω	1	100005	##J-651		FI-1	UF2SL =	Green Vert. Tilt-Panel
B	2500Ω	1				R3-13	UR2SL =	Green Vert. Amp. -Rear

* CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS & SHAFTS: B17-118 & P9-101 (Panel) B17-146 & RU-113 (Rear)

**CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS & SHAFTS: B11-103 & P9-101 (Panel) B11-111 & RU-112 (Rear)

* CONCENTRIKIT EQUIVALENT: K-3 KIT, BASE ELEMENTS & SHAFTS: W11-116 & P3-118 (Panel) B13-137A & RU-207 (Rear) 76-1 Switch

**CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS & SHAFTS: B11-137 & P9-104 (Panel) B11-123 & RU-112 (Rear)

* CONCENTRIKIT EQUIVALENT: K-5 KIT, BASE ELEMENTS & SHAFTS: B11-139 & P11-018 (Panel) B11-144 & RU5-014 (Rear)

† Universal Replacement (Mallory Exact Duplicate Part No. US503Ws)
†† Universal Replacement (Mallory Exact Duplicate Part No. UE-3050)
††† Universal Replacement (Mallory Exact Duplicate Part No. UE-1519)
# Universal Replacement (Mallory Exact Duplicate Part No. US813W)
Universal Replacement (Mallory Exact Duplicate Part No. UE885)
Universal Replacement (Mallory Exact Duplicate Part No. UE14)

RESISTORS

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R26	100KΩ	1	503410	BTS-100K	
R27	100KΩ	1	503410	BTS-100K	
R28	22KΩ	1	503322	BTS-22K	
R29	120Ω	1	503312	BTS-120	
R30	2.2Meg	1	503582	BTS-2.2Meg	
R31	220KΩ	1	503422	BTS-220K	
R32	270KΩ	1	503427	BTS-270K	
R33	100KΩ	1	503410	BTS-100K	
R34	10KΩ	1	503310	BTS-10K	
R35	47Ω	1	503047	BTS-47	
R36	10KΩ	1	503310	BTS-10K	
R37	1000Ω	1	503210	BTS-1000	
R38	10MΩ	10	79837	1-1/4A-10K	
R39	100Ω	3	503110	BTS-100	
R40	56Ω	3	503056	BTS-56	
R41	68Ω	3	503068	BTS-68	
R42	4700Ω	3	503247	BTS-4700	
R43	12KΩ	3	503312	BTS-12K	
R44	100Ω	3	503110	BTS-100	
R45	3.3Meg 5%	1	502533	BTS-3.3Meg 5%	
R46	3900 9%	1	502156	BTS-560 9%	
R47	330Ω 5%	1	502135	BTS-330 5%	
R48	100Ω 5%	1	502110	BTS-100 5%	
R49	6Ω 5%	3	3579	BTS-62 5%	
R50	47KΩ	3	503247	BTS-47K	
R51	10KΩ	3	503310	BTS-10K	
R52	62Ω 5%	3	3579	BTS-62 5%	
R53	330KΩ 5%	1	502433	BTS-330K 5%	
R54	10KΩ	3	503310	BTS-10K	
R55	3.3KΩ 5%	1		BTS-3K3 5%	
R56	33KΩ 5%	1	502333	BTS-33K 5%	
R57	6Ω 5%	3	3579	BTS-62 5%	
R58	100Ω	3	503110	BTS-100	
R59	10KΩ	3	503310	BTS-10K	
R60	10MΩ	1	503510	BTS-10M	
R61	1000Ω			BTS-1000	
R62	150Ω		503115	BTS-150	
R63	10KΩ	1	503310	BTS-10K	
R64	3900Ω 5%	1	502239	BTS-3900 5%	
R65	120Ω 5%	1	502112	BTS-120 5%	
R66	2200	5	79908		
R67	330Ω 5%	1	502133	BTS-330 5%	
R68	220KΩ 5%	1	502423	BTS-220K 5%	
R69	2200Ω 5%	1	502222	BTS-2200 5%	
R70	4700Ω 5%	1	502247	BTS-4700 5%	
R71	10KΩ	1	503310	BTS-10K	
R72	120Ω	1	503312	BTS-120	
R73	27KΩ	1	503327	BTS-27K	
R74	4700Ω	1	503247	BTS-4700	
R75	13500Ω	10	79824		
R76	10KΩ	10	79182		
R77	2200 5%	2	502222	BTS-2200 5%	
R78	15000 5%	1	502353	BTS-15000 5%	
R79	1800 5%	1	502318	BTS-1800 5%	
R80	120Ω	1	503312	BTS-120	
R81	1.2Meg	1	503512	BTS-1.2Meg	
R82	33KΩ	3	503333	BTS-33K	
R83	18KΩ	3	503318	BTS-18K	
R84	3300Ω	3	503233	BTS-3300	
R85	33KΩ	3	503333	BTS-33K	
R86	22KΩ	3	503322	BTS-22K	
R87	470KΩ 5%	1	502447	BTS-470K 5%	
R88	820KΩ 5%	1	502483	BTS-820K 5%	
R89	62Ω 5%	3	502083	BTS-62 5%	
R90	22KΩ	2	503322	BTS-22K	
R91	33KΩ	3	503333	BTS-33K	
R92	47KΩ	3	503347	BTS-47K	
R93	18KΩ	3	503318	BTS-18K	
R94	56KΩ	2	503356	BTS-56K	
R95	2.2Meg	1	503522	BTS-2.2Meg	
R96	4.7Meg	1	503547	BTS-4.7Meg	
R97	470KΩ 5%	1	502447	BTS-470K 5%	
R98	820KΩ 5%	1	502483	BTS-820K 5%	
R99	62Ω 5%	3	502083	BTS-62 5%	
R100	22KΩ	2	503322	BTS-22K	
R101	33KΩ	3	503333	BTS-33K	
R102	47KΩ	3	503347	BTS-47K	
R103	18KΩ	3	503318	BTS-18K	
R104	56KΩ	2	503356	BTS-56K	
R105	56KΩ	2	503356	BTS-56K	
R106	39KΩ	3	503339	BTS-39K	
R107	47Ω 5%	3	502047	BTS-47 5%	
R108	39KΩ	3	503339	BTS-39K	
R109	62Ω 5%	3	502083	BTS-62 5%	
R110	10KΩ 5%	1	502310	BTS-10K 5%	
R111	10KΩ 1%	1	502310	BTS-10K 1%	
R112	1000Ω 5%	1	502210	BTS-1000 5%	
R113	33KΩ	3	503333	BTS-33K	
R114	10MΩ	1	503510	BTS-10M	
R115	330KΩ	3	503433	BTS-330K	
R116	470KΩ	3	503447	BTS-470K	
R117	330Ω	1	79685		
R118	33Ω	1	79465		
R119	470Ω	1	503147	BTS-470	
R120	27KΩ	1	503327	BTS-27K	
R121	680KΩ	1	503468	BTS-680K	
R122	22KΩ	1	503322	BTS-22K	
R123	390Ω	1	503339	BTS-390	
R124	56KΩ	3	503356	BTS-56K	
R125	270KΩ	3	503427	BTS-270K	
R126	2.2Meg	1	503522	BTS-2.2Meg	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R127	820KΩ	1	503482	BTS-820K	
R128	560KΩ	1	503456	BTS-560K	
R129	47KΩ	1	503347	BTS-47K	
R130	47KΩ	1	503347	BTS-47K	
R131	1.2Meg	1	503512	BTS-1.2Meg	
R132	33KΩ	3	503333	BTS-33K	
R133	18KΩ	3	503318	BTS-18K	
R134	3300Ω	3	503233	BTS-3300	
R135	33KΩ	3	503333	BTS-33K	
R136	33KΩ	3	503333	BTS-33K	
R137A	23KΩ			BTS-23K	
B	23KΩ		#79548	BTS-23K	
C	8200Ω			BTS-8200	
D	8200Ω			BTS-8200	
R138	1Meg	1	503510	BTS-1Meg	
R139	1Meg	1	503510	BTS-1Meg	
R140	1.5Meg	1	503518	BTS-1.5Meg	
R141	2.7Meg	3	503527	BTS-2.7Meg	
R142	470KΩ	3	503447	BTS-470K	
R143	22KΩ 5%	1	502322	BTS-22K 5%	
R144	100KΩ	3	503410	BTS-100K	
R145	2.2Meg	1	503522	BTS-2.2Meg	
R146	470Ω	1	503147	BTS-470	
R147	100KΩ	3		BTS-100K	
R148	150KΩ	3	503416	BTS-150K	
R149	82KΩ	3	503382	BTS-82K	
R150	560Ω	1		BTS-560	
R151	560Ω	1		BTS-560	
R152	330KΩ	1	513433	BTS-330K	
R153	820KΩ	1	513482	BTS-820K	
R154	82KΩ	1	513382	BTS-82K	
R155	150KΩ 5%	1	513415	BTS-150K 5%	
R156	3900Ω 5%	1	502319	BTS-3900 5%	
R157	56KΩ	1	513356	BTS-56K	
R158	82KΩ	1	513382	BTS-82K	
R159	820KΩ 5%	1	513410	BTS-820K 5%	
R160	150KΩ	1	503415	BTS-150K	
R161	8200Ω 5%	1	502282	BTS-8200 5%	
R162	33KΩ	1	513339	BTS-33K	
R163	220KΩ	1	503423	BTS-220K	
R164	33KΩ	1	503133	BTS-33K	
R165	11KΩ	10	79837		
R166	56Ω	1	502056	BTS-56	
R167	47000	1	513247	BTS-4700	
R168	56KΩ	2		BTS-56K	
R169	6.8Meg	3	532563	BTS-6.8Meg 5%	
R170	1.2Meg	2	532563	BTS-6.2Meg 5%	
R171	2.7Meg	2	532527	BTS-2.7Meg 5%	
R172	68Meg	2	100010	BTS-4.7Meg	
R173	4.5Meg	1	100009	BTS-4.7Meg	
R174	4700Ω	1	503247	BTS-4700	
R175	10KΩ	1	503310	BTS-10K	
R176	150Ω	1	503115	BTS-150	
R177	39KΩ	1	513339	BTS-39K	
R178	2700Ω	1	503327	BTS-2700	
R179	10KΩ	1	513310	BTS-10K	
R180	56KΩ	1	503356	BTS-56K	
R181	10KΩ	1	503310	BTS-10K	
R182	22KΩ	3	503322	BTS-22K	
R183	100KΩ	3	503410	BTS-100K	
R184	1800Ω	1	513218	BTS-1800	
R185	39KΩ 5%	2	502339	BTS-39K 5%	
R186	33KΩ 5%	2	502330	BTS-33K 5%	
R187	2200Ω 5%	1	502222	BTS-2200 5%	
R188	33KΩ	1		BTS-33K	
R189	2200Ω	1	503222	BTS-2200	
R190	10KΩ	1	503310	BTS-10K	
R191	1Meg 5%	1	502510	BTS-1Meg 5%	
R192	1Meg 5%	1	502510	BTS-1Meg 5%	
R193	15KΩ	1	503315	BTS-15K	
R194	23Meg 5%	2	522632	BTS-23Meg5%	
R195	1Meg 5%	1	502510	BTS-1Meg 5%	
R196	47KΩ	1	513347	BTS-47K	
R197	15KΩ	1	503315	BTS-15K	
R198	1000Ω 5%	1	502210	BTS-1000 5%	
R199	3300Ω 5%	1	502133	BTS-3300 5%	
R200	27KΩ	2	533327	BTS-27K	
R201	13KΩ	1	513313	BTS-13K	
R202	2200Ω	1	503222	BTS-23K	
R203	150KΩ	1	502415	BTS-150K	
R204	39KΩ	2	522339	BTS-39K	
R205	180Ω	1	503118	BTS-180	
R206	47KΩ	1	513347	BTS-47K	
R207	2200Ω	1	502210	BTS-2200	
R208	56Ω	1	502056	BTS-56	
R209	5600 5%	1		BTS-560 5%	

* Items R137A, R137B, R137C, R137D, C105A, C105B, C105C, C105D are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Stancor PART No	Thordorson PART No	Triad PART No	NOTES
T1	117VAC ④ 4.6A	190VAC .695ADC	6.3VAC ⑤ 1A	79971							
	SEC. 3	SEC. 4	SEC. 5								
	6.3VAC ⑥ 1.72A										

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	74144	B6701	A-4003		V402	A-8122	26A03⑦	A-97Y
T3	Horiz. Output Trans.	79542							
T4	Vert. Output Trans.	79530	21900①②	A-3823 ①		V309①	A-8145	26B72 ①	A-108X①
T5A	Yoke-Horiz (Ll-5MH)	79605 ③							
B	Vert (80MH)								
T6	Horiz. Lin Coil (.045- 34MH) ④	79645							
T7	Width Choke (1.0MH)	79787							
T8	Width Choke (.5MH)	79787							
T9	Vert. Centering Choke	78900							
T10	Horiz. Centering Choke	79644							
T11A	Green) Dynamic Con-	100010 ⑤							
B	Blue) vergence Yoke	100020 ⑤							
C	Red)	100021 ⑤							
		79668 ⑤							
T12	Dynamic Convergence Inductor Assy	79664							

① Drill new mounting hole(s).
② Use 9 to 1 turns ratio.
③ Includes choke C139, resistors R150 and R151.
④ Two coils, bifilar wound. Total inductance, coils connected series aiding (.17-1.4MH).
⑤ Yoke piece center coil (2 used).
⑥ Control magnet and knob assembly (3 used).
⑦ Yoke piece magnet assembly (3 used).
⑧ Male plug for center coil (3 used).

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T15	6KΩ	1.75Ω	79980	21007	A-3801	A-3849	24981	S-53X	

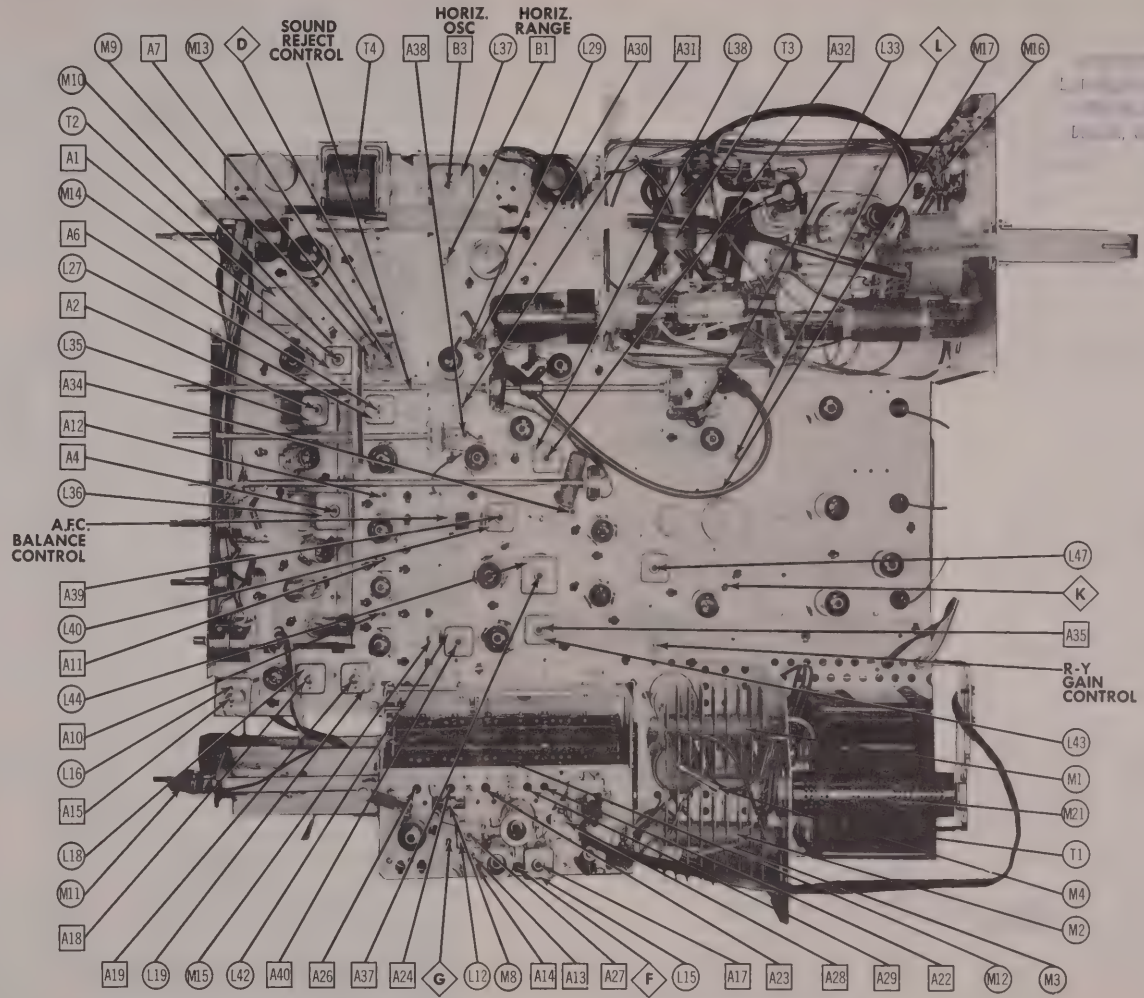
SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3 30	74664	8A31	
SP2	8"	PM	3 31	74664	8A31	

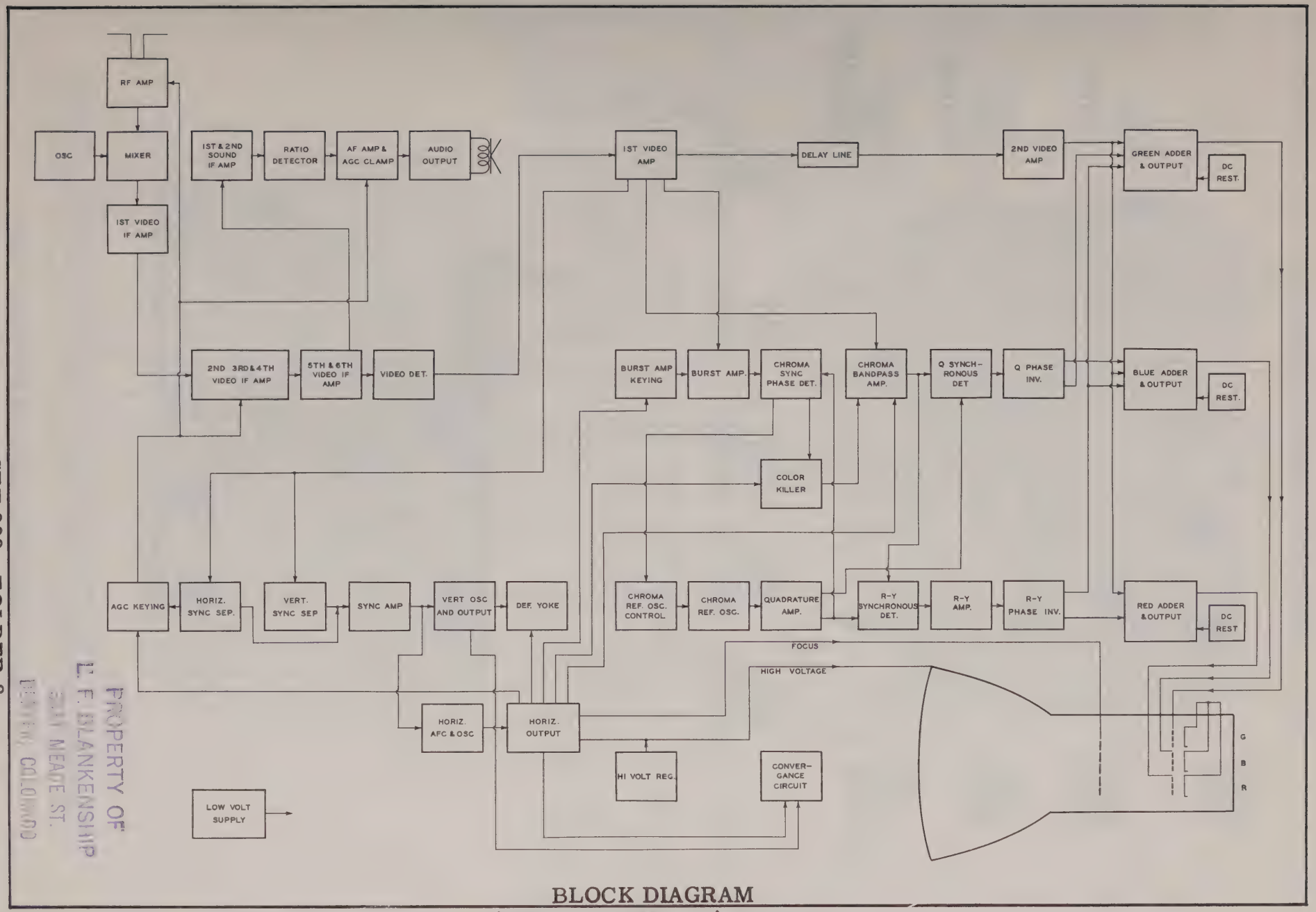
COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	SEC.	REPLACEMENT DATA: RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω		77625				
L2	IF Trap	0Ω		77625				
L3A	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77603				Channels 2-4, includes capacitors.
B	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77603				Channels 5-6, includes capacitors
C	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77604				Channels 7-10, includes capacitors
D	VHF Ant., RF, Mixer & Osc. Coils	0Ω		77605				Channels 11-13, includes capacitors
E	UHF Ant., RF, Mixer & Osc. Coils	0Ω						Channels 14-83, includes capacitors
F	UHF Ant., RF, Mixer & Osc. Coils	0Ω						Channels 53-68, includes capacitors
G	UHF Ant., RF, Mixer & Osc. Coils	0Ω						Channels 69-83, includes capacitors
L4	IF Trap	.2Ω		77628				
L5	Neut. Coil	0Ω		77627				
L6	RF Choke	1.4Ω		77695				Wound on 470KΩ resistor
L7	RF Choke	1.4Ω		77695				11 Microhenries
L8	FIL Choke	0Ω		77634				11 Microhenries
L9	FIL Choke	0Ω		77632				
L10	Cathode Choke	0Ω		77629				
L11	RF Choke	0Ω		79324				
L12	IF Input Transformers	.1Ω	.1Ω	77609				
L13	IF Coupling Transformers Primary	0Ω						
L14	IF Coupling Transformers Secondary	0Ω						Includes 3300Ω resistor
L15	1st. Video IF	.2Ω	.2Ω	79100				
L16	2nd. Video IF Grid	.2Ω	.4Ω	78967	17-4515 ⑨			Includes coupling coil, 4L 33MC trap and cape.
L17	FIL. Choke	0Ω		78477	19-3001	TV-189	4604	1 Microhenry
L18	2nd. Video IF Plate	.1Ω		78968	17-4519		6317	Includes 40.75MC trap, 6.3KΩ resistor, and 100MMF & 10MMF caps.
L19	3rd. Video IF Grid	.1Ω		78969	17-4530		6318	Includes 47.25MC trap and 68MMF cap.
L20	RF Choke	1Ω		78945	19-1003		4606	3.3 Microhenries
L21	FIL. Choke	0Ω		78477	19-3001	TV-189	4604	1 Microhenry
L23	4th. Video IF	.1Ω	.1Ω	78990	17-4533		6319	
L23	FIL. Choke	0Ω		78477	19-3001	TV-189	4604	1 Microhenry
L24	5th. Video IF	.1Ω	.1Ω	78991	17-4533		6319	
L25	FIL. Choke	0Ω		78477	19-3001	TV-189	4604	1 Microhenry
L26	6th. Video IF	.1Ω	.1Ω	78992	17-4533		6319	
L27	7th. Video IF	.1Ω		78993	17-4504		6318	Includes 47.25MC trap
L28	Shunt Peaking Coil	8Ω		74314	19-3180	TV-184	6180	180 Microhenries

RCA VICTOR MODELS 21-CT-55 (Ch. CTC2B & CTC3A)



CHASSIS-TOP VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



BLOCK DIAGRAM

21-CT-55 (Ch. CTC2B & CTC3A)

RCA VICTOR MODELS

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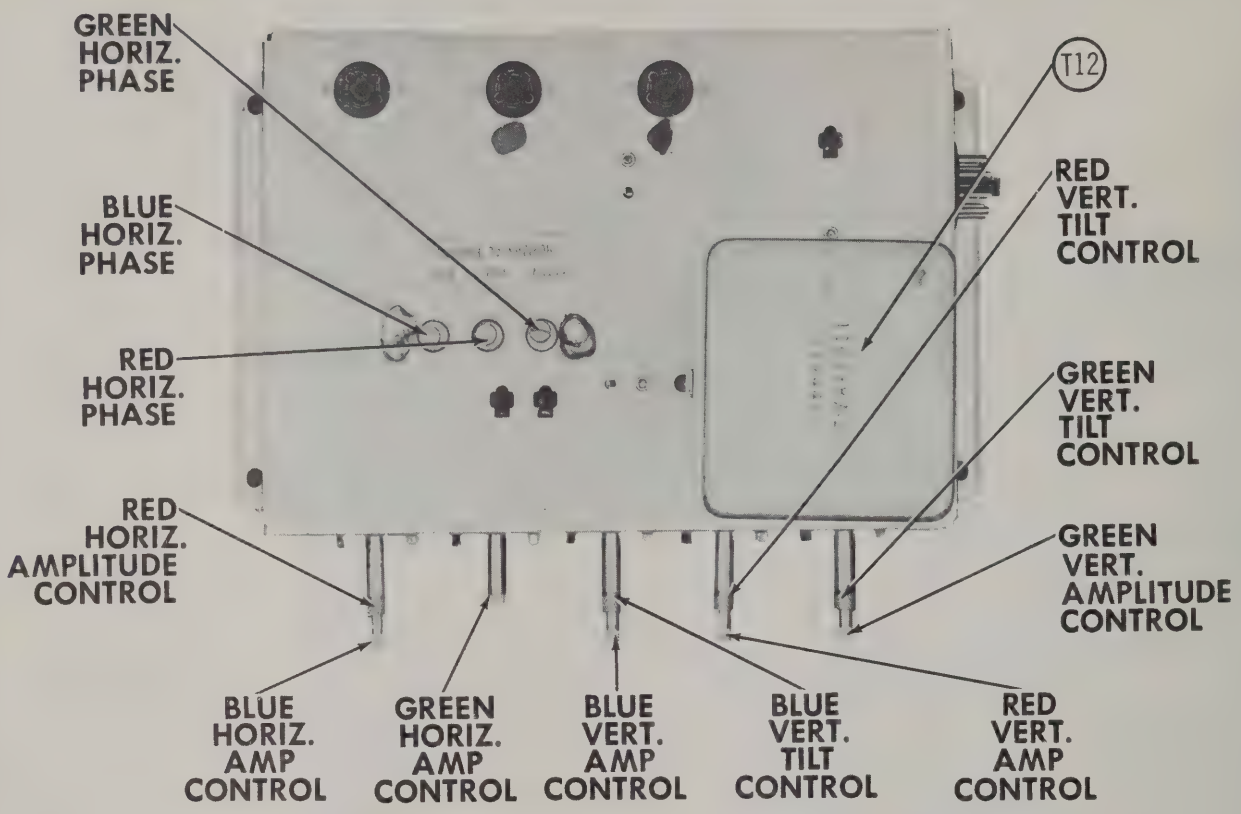
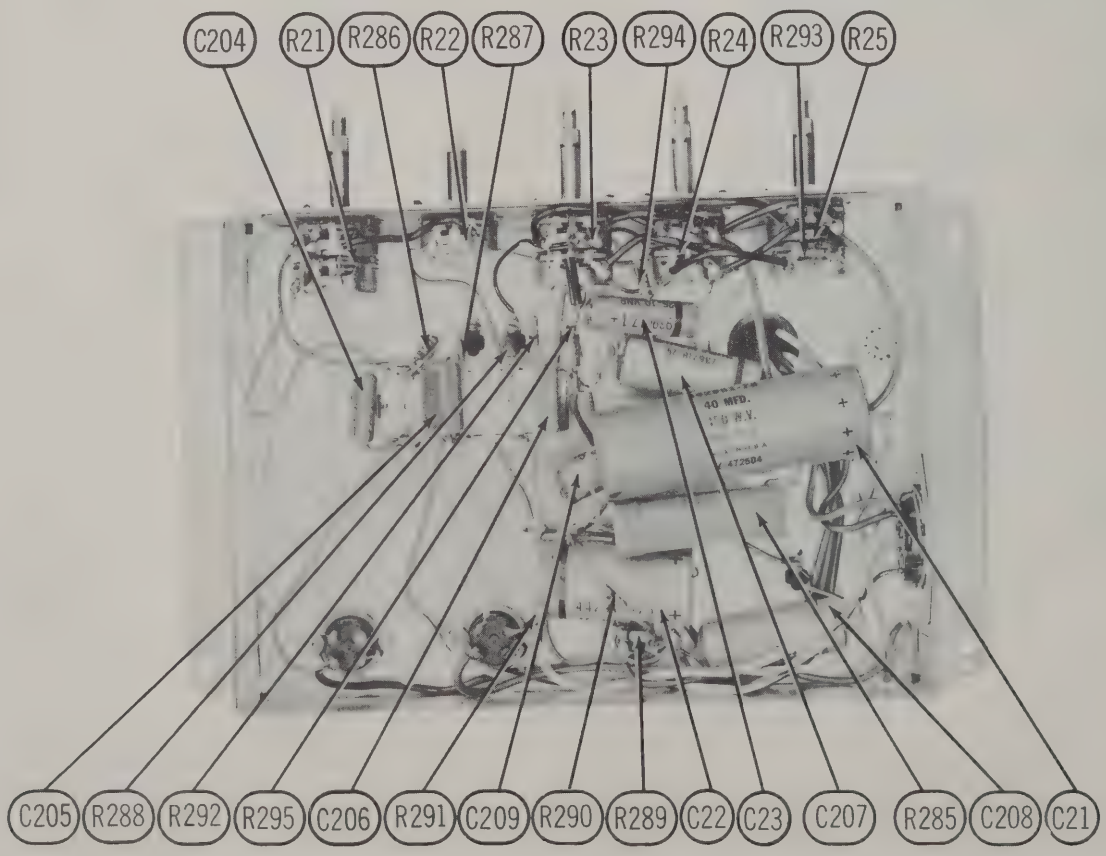
3311 MEADE ST.
DENVER, COLORADO



CONVERGENCE CHASSIS TOP VIEW



CONVERGENCE CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS (cont)

FIG. 13

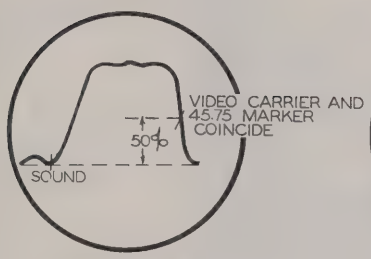


FIG. 14

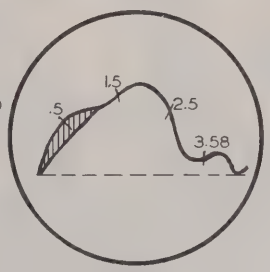


FIG. 15

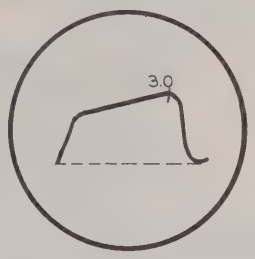


FIG. 16

FIG. 17

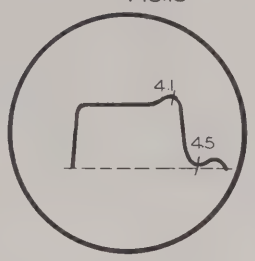


FIG. 18

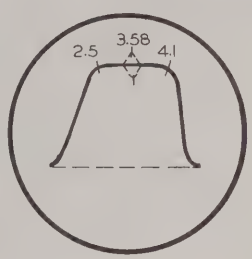


FIG. 19

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75	23	524-530	525.25	529.75	44	650-656	651.25	655.75	64	770-776	771.25	775.75
3	60-66	61.25	65.75	24	530-536	531.25	535.75	45	656-662	657.25	661.75	65	776-782	777.25	781.75
4	66-72	67.25	71.75	25	536-542	537.25	541.75	46	662-668	663.25	667.75	66	782-788	783.25	787.75
5	76-82	77.25	81.75	26	542-548	543.25	547.75	47	668-674	669.25	673.75	67	788-794	789.25	793.75
6	82-88	83.25	87.75	27	548-554	549.25	553.75	48	674-680	675.25	679.75	68	794-800	795.25	799.75
7	174-180	175.25	179.75	28	554-560	555.25	559.75	49	680-686	681.25	685.75	69	800-806	801.25	805.75
8	180-186	181.25	185.75	29	560-566	561.25	565.75	50	686-692	687.25	691.75	70	806-812	807.25	811.75
9	186-192	187.25	191.75	30	566-572	567.25	571.75	51	692-698	693.25	697.75	71	812-818	813.25	817.75
10	192-198	193.25	197.75	31	572-578	573.25	577.75	52	698-704	699.25	703.75	72	818-824	819.25	823.75
11	198-204	199.25	203.75	32	578-584	579.25	583.75	53	704-710	705.25	709.75	73	824-830	825.25	829.75
12	204-210	205.25	209.75	33	584-590	585.25	589.75	54	710-716	711.25	715.75	74	830-836	831.25	835.75
13	210-216	211.25	215.75	34	590-596	591.25	595.75	55	716-722	717.25	721.75	75	836-842	837.25	841.75
14	470-476	471.25	475.75	35	596-602	597.25	601.75	56	722-728	723.25	727.75	76	842-848	843.25	847.75
15	476-482	477.25	481.75	36	602-608	603.25	607.75	57	728-734	729.25	733.75	77	848-854	849.25	853.75
16	482-488	483.25	487.75	37	608-614	609.25	613.75	58	734-740	735.25	739.75	78	854-860	855.25	859.75
17	488-494	489.25	493.75	38	614-620	615.25	619.75	59	740-746	741.25	745.75	79	860-866	861.25	865.75
18	494-500	495.25	499.75	39	620-626	621.25	625.75	60	746-752	747.25	751.75	80	866-872	867.25	871.75
19	500-506	501.25	505.75	40	626-632	627.25	631.75	61	752-758	753.25	757.75	81	872-878	873.25	877.75
20	506-512	507.25	511.75	41	632-638	633.25	637.75	62	758-764	759.25	763.75	82	878-884	879.25	883.75
21	512-518	513.25	517.75	42	638-644	639.25	643.75	63	764-770	765.25	769.75	83	884-890	885.25	889.75
22	518-524	519.25	523.75	43	644-650	645.25	649.75								

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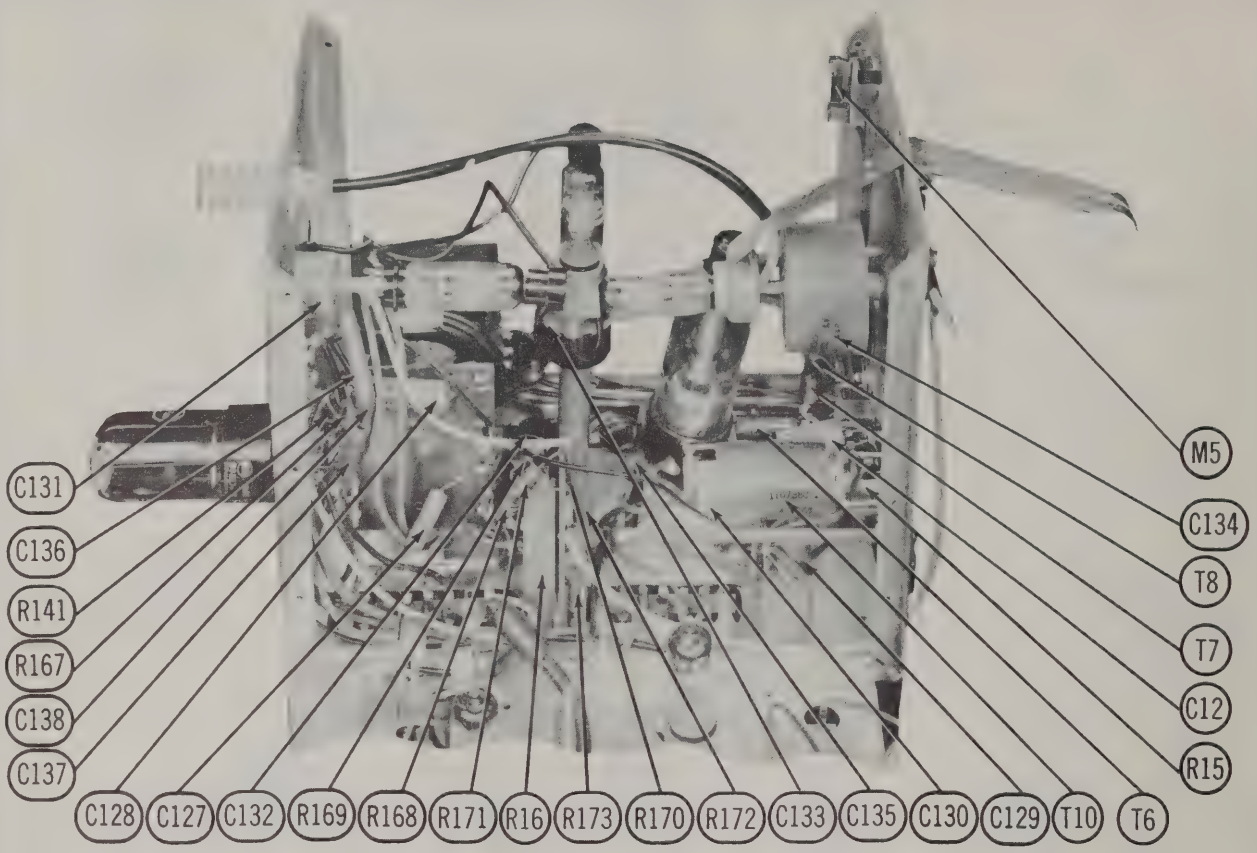
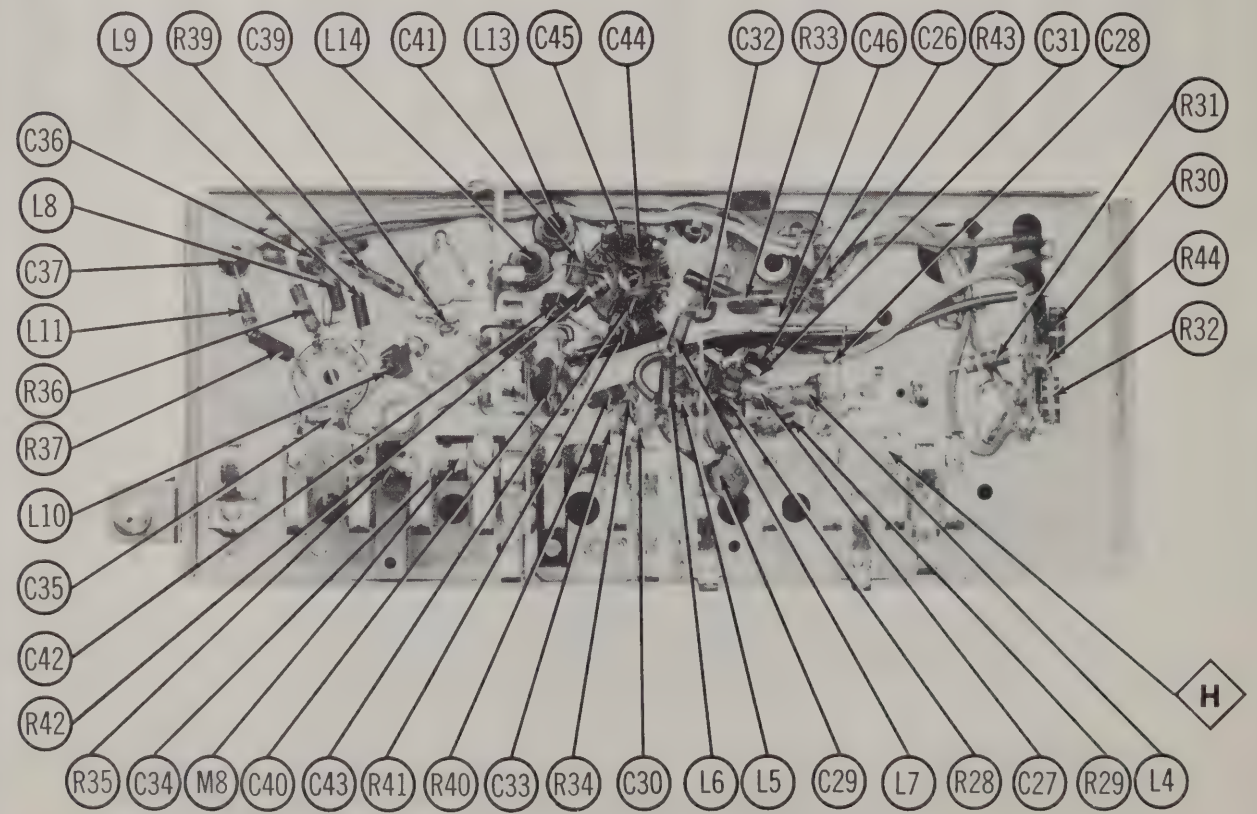
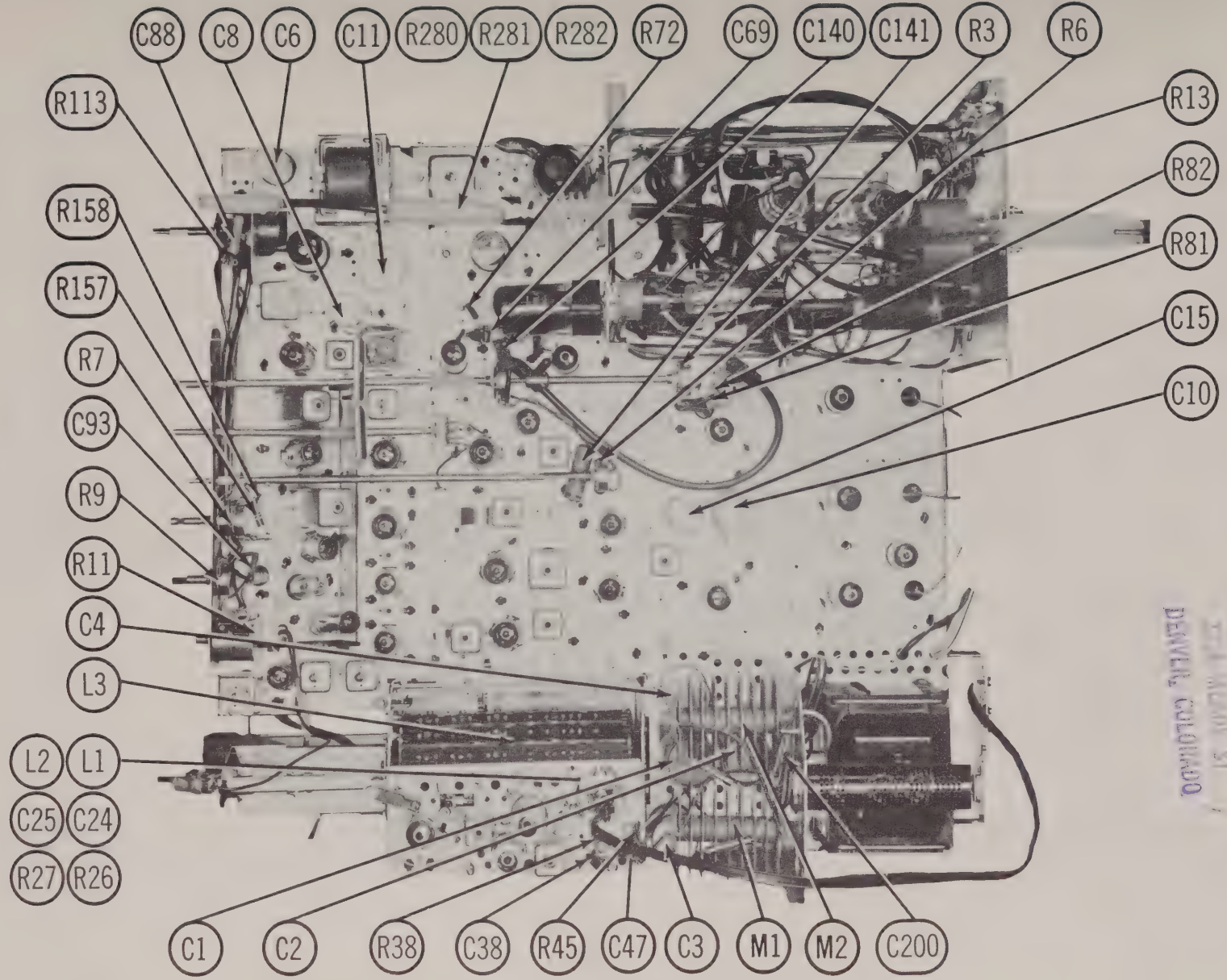
DENVER, COLORADO



HIGH VOLTAGE COMPARTMENT



RF TUNER-BOTTOM VIEW



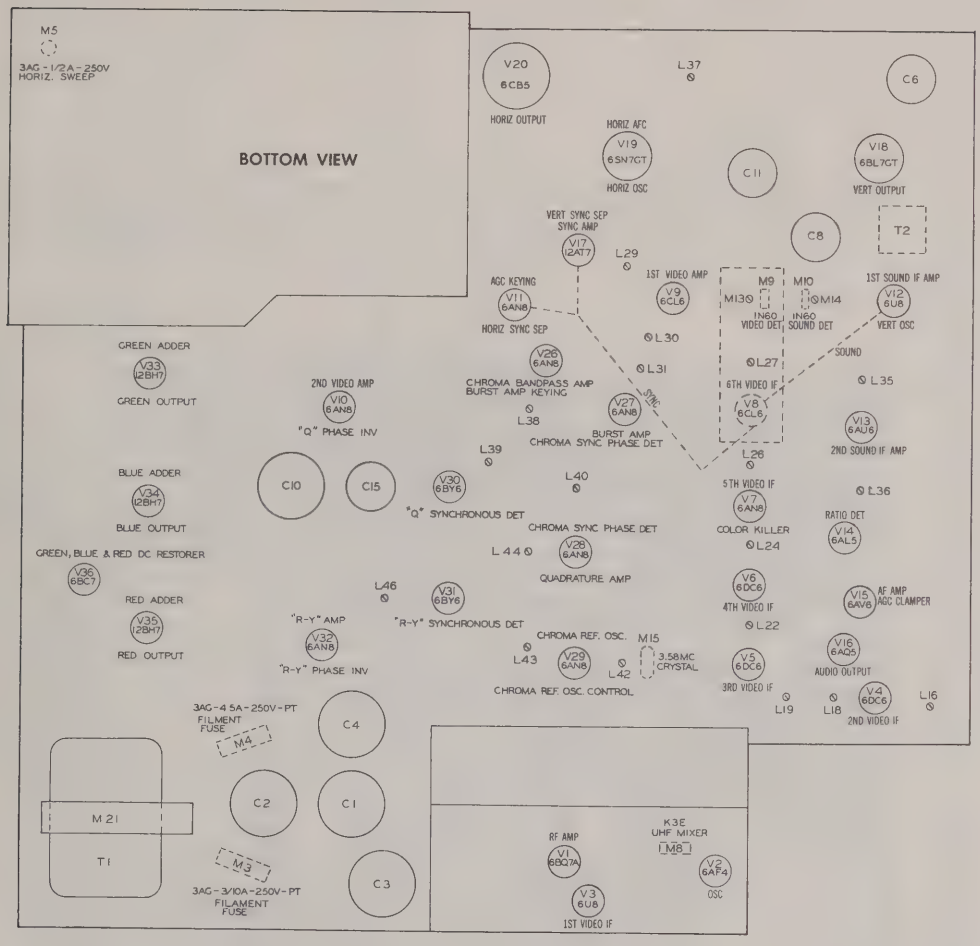
CHASSIS TOP VIEW CAPACITOR & RESISTOR IDENT.

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	†L 7KΩ	10Meg	10Meg	0Ω	. 1Ω	10Meg	600KΩ	120Ω	0Ω
V 2	6AF4	†12KΩ	10KΩ	. 1Ω .	0Ω	0Ω	10KΩ	†12KΩ		
V 3	6U8	INF	INF	†13KΩ	0Ω	. 1Ω	†700Ω	INF	56Ω	0Ω
V 4	6DC6	75KΩ	62Ω	0Ω	. 1Ω	†11KΩ	†47KΩ	0Ω		
V 5	6DC6	75KΩ	62Ω	0Ω	. 1Ω	†11KΩ	†11KΩ	0Ω		
V 6	6DC6	40KΩ	62Ω	. 1Ω	0Ω	†11KΩ	†11KΩ	0Ω		
V 7	6AN8	27KΩ	†22Meg	0Ω	. 1Ω	0Ω	†11KΩ	†11KΩ	1KΩ	150Ω
V 8	6CL6	120Ω	. 1Ω	†3KΩ	. 1Ω	0Ω	†3KΩ	0Ω	†3KΩ	. 1Ω
V 9	6CL6	120Ω	7KΩ	†7KΩ	0Ω	. 1Ω	†5. 5KΩ	0Ω	†7KΩ	7KΩ
V 10	6AN8	†15KΩ	390KΩ	3KΩ	0Ω	. 1Ω	†11KΩ	†47KΩ	2. 2Meg	1. 7KΩ
V 11	6AN8	†3. 9KΩ	†35KΩ	400KΩ	†10KΩ	†10KΩ	300KΩ	†3. 6Ω	1. 7Meg	†600Ω
V 12	6U8	▲5Meg	4Ω	†12KΩ	0Ω	. 1Ω	†12KΩ	82Ω	0Ω	1. 6Meg
V 13	6AU6	47KΩ	0Ω	. 1Ω	0Ω	†18KΩ	†30KΩ	0Ω		
V 14	6AL5	11KΩ	11KΩ	0Ω	. 1Ω	INF	0Ω	INF		
V 15	6AV6	10Meg	0Ω	0Ω	. 1Ω	600KΩ	600KΩ	†330KΩ		
V 16	6AQ5	470KΩ	700Ω	0Ω	. 1Ω	†L 6KΩ	†L 3KΩ	470KΩ		
V 17	12AT7	360KΩ	2. 2Meg	0Ω	0Ω	0Ω	†13KΩ	†L 2Meg	0Ω	. 1Ω
V 18	6BL7GT	2. 3Meg	†L 1KΩ	1KΩ	2. 3Meg	†L 1KΩ	1KΩ	. 1Ω	0Ω	
V 19	6SN7GT	1. 3Meg	†55KΩ	230KΩ	250KΩ	†45KΩ	0Ω	0Ω	. 1Ω	
V 20	6CB5	†11KΩ	. 1Ω	0Ω	500KΩ	500KΩ	0Ω	0Ω	†11KΩ	
V 21	6BL4	NC	NC	INF	TP	†44Ω	NC	. 1Ω	0Ω	
V 22	3A2	20Meg	20Meg	NC	20Meg	20Meg	20Meg	NC	20Meg	20Meg
V 23	3A2	INF	INF	INF	INF	INF	INF	INF	INF	INF
V 24	3A2	INF	INF	INF	INF	INF	INF	INF	INF	INF
V 25	6BD4A	†1. 6Ω	†10KΩ	NC	NC	5Meg	NC	†10KΩ	NC	TOP CAP INF
V 26	6AN8	†20KΩ	100KΩ	1. 8KΩ	0Ω	. 1Ω	†11KΩ	†25KΩ	40KΩ	150Ω
V 27	6AN8	. 5Ω	. 5Ω	†25Meg	. 1Ω	0Ω	†2. 8KΩ	†600Ω	2. 2KΩ	1. 8KΩ
V 28	6AN8	†22Meg	†22Meg	. 5Ω	. 1Ω	0Ω	†2. 8KΩ	†47KΩ	. 2Ω	180Ω
V 29	6AN8	†39KΩ	150KΩ	. 4Ω	0Ω	. 1Ω	†2. 8KΩ	†11KΩ	†22Meg	330Ω
V 30	6BY6	1. 5Ω	100Ω	0Ω	. 1Ω	†25KΩ	†13KΩ	. 5Ω		
V31	6BY6	58Ω	100Ω	0Ω	. 1Ω	†8KΩ	†13KΩ	. 5Ω		
V32	6AN8	†8KΩ	390KΩ	6. 2KΩ	0Ω	. 1Ω	†10KΩ	†47KΩ	1Meg	350Ω
V33	12BH7	†5. 3KΩ	1. 8Meg	450Ω	0Ω	0Ω	†11KΩ	1. 6KΩ	200Ω	. 1Ω
V34	12BH7	†5. 3KΩ	1. 8Meg	450Ω	0Ω	0Ω	†11KΩ	600Ω	200Ω	. 1Ω
V35	12BH7	†5. 3KΩ	1. 8Meg	450Ω	0Ω	0Ω	†11KΩ	3. 5KΩ	200Ω	. 1Ω
V36	6BC5	1Meg	8. 2K	0Ω	. 1Ω	0Ω	7. 5KΩ	1Meg	5KΩ	1Meg
V37	21AXP22	†16KΩ	1Meg	†100KΩ	†5KΩ	†5KΩ	1Meg	†100KΩ	NC	20Meg
		PIN 10 NC	PIN 11 †100KΩ	PIN 12 1Meg	PIN 13 †5KΩ	PIN 13 †16KΩ				

†MEASURED FROM OUTPUT OF M2.
▲MEASURED FROM PIN 3 OF V21.
TP-TIE POINT.
NC-NO CONNECTION.

TUBE PLACEMENT CHART



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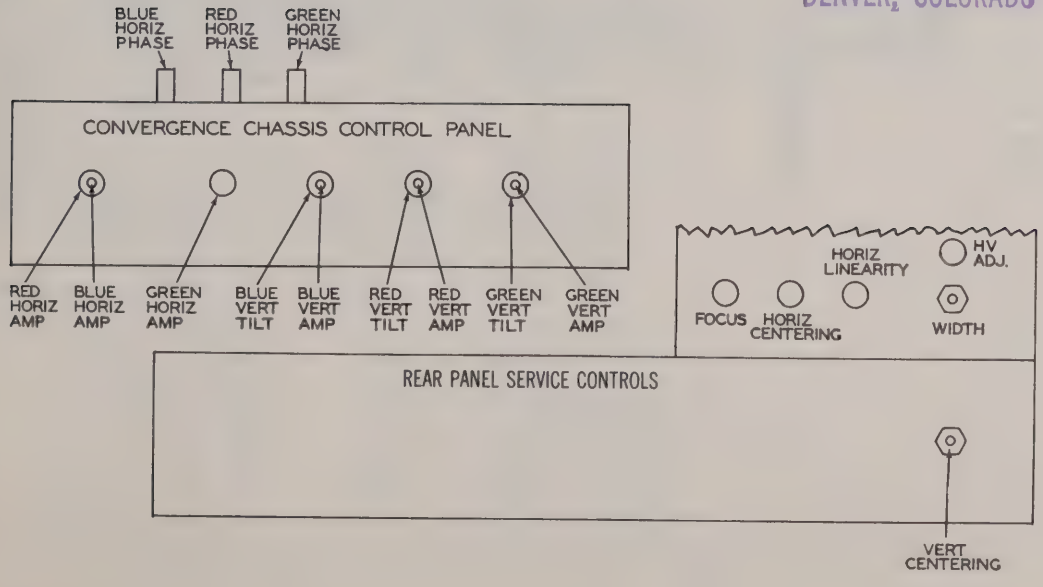
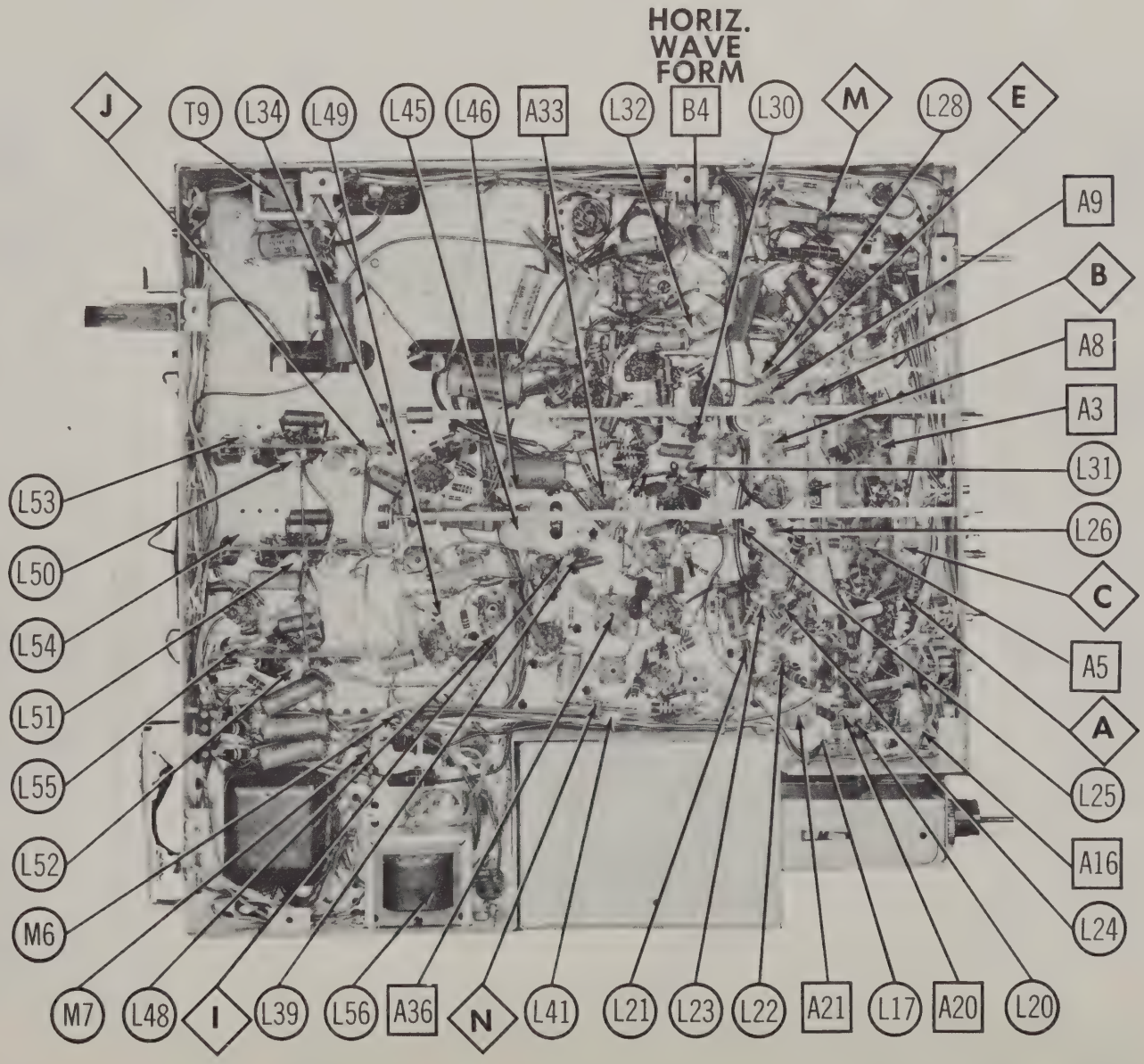
DENVER, COLORADO





CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	RF Amp	6BQ7A	6BQ7A	9AJ	
V2	Osc.	6AF4	6AF4	7DK	
V3	1st Video IF Amp.	6U8	6U8	9AE	
V4	2nd Video IF Amp.	6DC6	6DC6	7CM	
V5	3rd Video IF Amp.	6DC6	6DC6	7CM	
V6	4th Video IF Amp.	6DC6	6DC6	7CM	
V7	5th Video IF Amp. - Color Killer	6AN8	6AN8	9DA	
V8	6th Video IF Amp.	6CL6	6CL6	9BV	
V9	1st Video Amp.	6CL6	6CL6	9BV	
V10	2nd Video Amp. - "Q" Phase Inv.	6AN8	6AN8	9DA	
V11	AGC Keying- Horiz. Sync Sep.	6AN8	6AN8	9DA	
V12	1st Sound IF Amp. - Vert. Osc.	6U8	6U8	9AE	
V13	2nd Sound IF Amp.	6AU6	6AU5	7BK	
V14	Ratio Det.	6AL5	6AL5	6BT	
V15	AF Amp. - AGC Clamper	6AV6	6AV6	7BT	
V16	Audio Output	6AQ5	6AQ5	7BZ	
V17	Vert. Sync Sep. - Sync Amp.	12AT7	12AT7	9A	
V18	Vert. Output	6BL7GT	6BL7GT	8BD	
V19	Horiz. AFC- Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6CB5	6CB5		
V21	Damper	6BL4	6BL4		
V22	Focus Rect.	3A2	3A2	9DT	
V23	HV Rect.	3A2	3A2	9DT	
V24	HV Doubler	3A2	3A2	9DT	
V25	HV Regulator	6BD4A	6BD4A		6BK4 used as alternate.
V26	Chroma Bandpass Amp. -Burst Amp. Keying	6AN8	6AN8	9DA	
V27	Burst Amp. - Chroma Sync Phase Det.	6AN8	6AN8	9DA	
V28	Chroma Sync Phase Det. - Quadrature Amp.	6AN8	6AN8	9DA	
V29	Chroma Ref. Osc. - Chroma Ref. Osc. - Control	6AN8	6AN8	9DA	
V30	"Q" Synchronous Detector	6BY6	6BY6	7CH	
V31	"R-Y" Synchronous Detector	6BY6	6BY6	7CH	
V32	"R-Y" Amp. "R-Y" Phase Inv.	6AN8	6AN8	9DA	
V33	Green Adder- Green Output	12BH7	12BH7	9A	
V34	Blue Adder- Blue Output	12BH7	12BH7	9A	
V35	Red Adder- Red Output	12BH7	12BH7	9A	
V36	Green, Blue & Red DC Restorer	6BC7	6BC7	9AX	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	RCA Victor PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V37	21AXP22			21AXP22			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	RCA Victor PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1	200	250	78957	FP126	TM-200-250	T-375	
C2	200	250	78957	FP126	TM-200-250	T-375	
C3	80	450	18950	FP149	TM-80-450	S-280	
C4	80	450	18950	FP149	TM-80-450	S-280	
C5	1000	3	79625	TC308	TD-1000-3NP		Note 1
C6A	▲10	450	78929	FP345.2	TM-3045	T-645	
B	■10	450					
C	20	25					
C7	5	50	78943	TC30	TD-5-50	MMT-0505	
C8A	▲500	6	78930	WP057	TM-500-25	S-170	
B	■35	300		TC78	TD-40-350	MTH-0650	
C9	15	450	78917	TC74	TD-16-450	FM-4516	
C10A	▲20	450	79976	FP376.5	TM-T20-450	T-140	
B	▲20	450					
C	■20	450					
C11A	60	25	78931	FP433	TM-4026	Q-430	
B	■10	450					
C	▲10	450					
D	▲20	150					
C12A	10	25	79786	TN111	TDL-D10-25	MTD-0210	
B	10	25					
C13	50	6	78573	TC29	TD-50-6	MMT-650	
C14	2	50	79181	TC302	TD-2-50	MMT-1505	
C15A	■35	300	78930	FP217.85	TM-500-25	S-040	
B	▲500	6			TD-40-350	FM-4540	
C16	2	350	78920	TC60	TD-2-450	FM-4504	
C17	2	350	78920	TC60	TD-2-450	FM-4504	
C18	4	350	78919	TC60	TD-4-450	FM-4504	
C19	4	350	78919	TC60	TD-4-450	FM-4504	
C20	4	350	78919	TC60	TD-4-450	FM-4504	
C21	40	450		TC78	TD-40-450	FM-4540	
C22	15	450	78917	TC74	TD-16-450	FM-4516	
C23	25	10	78924	TC1025	TD-25-10NP	MT-0250 *	Note 1
						MT-0250	

Note 1. Non-polarized unit.
* Connect negative leads together.

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	NOTES
C24	56			TCN-56	N750K-560	NT-5456	
C25	56			TCN-56	N750K-560	NT-5456	
C26	1000		77615				
C27	2		77210				
C28	6		74182				
C29	680		77624	DD-681	811-681	UC-5368	
C30	1000		77252	DD-102	801-001	DC-521	
C31	1000		77252	DD-102	801-001	DC-521	
C32	1000		77615				
C33	56		71924	D6-560	831-560	UC-5456	
C34	22		77621				
C35A	2		77667				
B	22						
C36	1000		77615				
C37	1000		77615				
C38	10000		73960	DD-103	811-01	DC-511	
C39	1000		77084	MFT-1000			
C40	680		77624	DD-681	811-681	UC-5368	
C41	.62		79166				
C42	1000		77615				
C43	680		77624	DD-681	811-681	UC-5368	
C44	680		77624	DD-681	811-681	UC-5368	
C45	680		77624	DD-681	811-681	UC-5368	
C46	10000		73960	DD-103	811-01	DC-511	
C47	470		77293	DD-471	813-471	UC-5347	
C48	820		78944	DD-801	831-801	DC-521	
C49	680		79980	DD-681	811-681	UC-5368	
C50	820		78944	DD-801	831-801	DC-521	
C51	820		78944	DD-801	831-801	DC-521	
C52	680		79980	DD-681	811-681	UC-5368	
C53	820		78944	DD-801	831-801	DC-521	
C54	820		78944	DD-801	831-801	DC-521	
C55	820		78944	DD-801	831-801	DC-521	
C56	680		79980	DD-681	811-681	UC-5368	
C57	820		78944	DD-801	831-801	DC-521	
C58	820		78944	DD-801	831-801	DC-521	
C59	330		79979	DD-331	811-331	UC-5333	
C60	820		78944	DD-801	831-801	DC-521	
C61	820		78944	DD-801	831-801	DC-521	
C62	680		79980	DD-681	811-681	UC-5368	
C63	820		78944	DD-801	831-801	DC-521	
C64	820		78944	DD-801	831-801	DC-521	
C65	820		78944	DD-801	831-801	DC-521	
C66	820		78944	DD-801	831-801	DC-521	
C67	820		78944	DD-801	831-801	DC-521	
C68	820		78944	DD-801	831-801	DC-521	
C69	330	500	79191				
C70	6						
C71	33		70596	D6-330	GP1K-330	UC-5433	
C72	.1	400	78922	DF-104		PT401	
C73	1500	500	39652			MCE456	
C74	.001	600	75643	D6-102	GP2L-102	PT621	
C75	.022	600		DF-203	817-02	PT6122	
C76	.0027	600	73599	D6-272	GP2-333-272	UC-5227	
C77	.47	400	78977			PT4047	
C78	.22	200	78905			PT4022	
C79	1.5		78928	TCZ-1R5	NP0A-1R5	ZT-5515	
C80	1200	500	39654				
C81	10000		73960	DD-103	811-01	DC-511	
C82	56		71924	D6-560	GP1K-560	UC-5456	
C83A	10000		75877	DD3-103	811-01	DC-511	
B	10000				811-01	DC-511	
C84	390	500	79988			MCB243	
C85	390	500	79988			MCB243	
C86	.0022	600	73595	D6-222	GP2-333-222	PT6222	
C87	.0015	600	73802	D6-152	GP2L-152	PT6215	
C88	.027	200	79989				
C89	.01	400	73561	D6-103	GP2-333-103	PT411	
C90	820		78944	DD-801	831-801	DC-521	
C91	.1	400	73551	DF-104		PT401	
C92	.0039	400	78221	D6-402	GP2-333-402	PT624	
C93	270	500	39638	D6-271	GP2K-271	UC-5327	
C94	.01	600	73594	D6-103	GP2-333-103	PT611	
C95	.0022	1600	73817	DD30-222	3KV-222	PT16222	
C96	820		78944	DD-801	831-801	DC-521	
C97	820		78944	DD-801	831-801	DC-521	
C98	10000		73960	DD-103	811-01	DC-511	
C99	.012	400	79781				
C100	270		78916	D6-271	GP2K-271	UC-5327	
C101	.027	400	73554				
C102	330	500	79191				
C103	.01	400	73561	D6-103	GP 2-333-103	PT411	
C104	.1	400	73551	DF-104		PT401	
C105A	10000				811-01	DC-511	
B	2000		♦79246	♦PC-101	801-002	DC-522	
C	5000				811-005	DC-525	
D	5000				811-005	DC-525	
C106	.0082	600	78979				
C107	.001	600	75249	D6-102	GP2L-102	PT621	
C108	.0033	600	73795	D6-332	GP2-333-332	PT6233	
C109	.22	600	74957			PT6022	
C110	.047	400	73557	DF-503		PT4147	
C111	.15	400	73793			PT4015	
C112	.022	600	73798	DF-203	817-02	PT6122	
C113	.001	1600	73849	DD16-102	1R5KV-102	PT1621	
C114	470	500	39644			MCB245	
C115	82	500	76474	TCZ-82	NP0-337-820		
C116	82		71514	TCN-82	N750L-820		
C117	.1	400	73551	DF-104		PT401	
C118	.01	400	73561	D6-103	GP2-333-103	PT411	
C119	.47	200	73787			PT4047	
C120	.047	400	73553	DF-503		PT4147	

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		RCA Victor PART No.	SYLVANIA PART No.	
M8	K3E	78972	1N82 or 1N82A	VHF-UHF Mixer
M9	1N60		1N60 or 1N132	Video Det.
M10	1N60		1N60 or 1N132	Sound Det.

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M11	Dial Light	11891	#44
M12	Tuner	KRK12C	VHF-UHF
M13	Video Det. Assy.	78994	Includes M9, coils and capacitors
M14	Sound Det. Assy.	78995	Includes M10, coils and capacitors
M15	Crystal	78896	3.579545MC Oscillator
M16	Switch	79651	Width (Rotary - wafer type)
M17	Delay Line	79998	Luminance Channel
M18	Magnet	79669	Blue Lateral Beam Positioning
M19	Magnet	79604	Purity Ring Assy.
M20	Magnetic Shield		Yoke
M21	Ballast Tube	79972	
A28	Trimmer Cap.	77616	Tuner - IF Trap (4-40MMF)
B1	Trimmer Cap.	74923	Horiz. Locking Range (4-70MMF)
	Trimmer Cap.	79621	Hue (4-25MMF)
	Trimmer Cap.	100008	3 Section (180-780MMF), Blue, red and green horiz. phasing
	Trimmer Cap.	938206-501	Ant. Matching Stub Trimmer
	Knob	79470	Brightness
	Knob	79588	Channel Selector
	Knob	75945	Contrast hue color saturation and tone
	Knob	100000	Fine tuning
	Knob	79471	On-off-volume
	Safety Glass	79591	
	Mask	79587	

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove 2 metal and 7 wood screws. Remove rear cover.

3. Disconnect 4 plugs from convergence chassis, speaker plug, picture tube socket, HV lead and deflection yoke plug.

4. Remove 7 chassis bolts. Remove chassis.

CONVERGENCE CHASSIS REMOVAL

1. Remove 4 plugs from chassis.

2. Remove 4 wood screws. Remove chassis.

SPEAKER REMOVAL

1. Remove speaker plug.

2. Remove 8 speaker nuts. Remove 2 speakers.

CABINET TOP REMOVAL

1. Remove rear cover.

2. Remove 4 top bolts.

3. Slide top to the rear about 1/2 inch and lift up and off.

PICTURE TUBE REMOVAL

1. Remove main chassis and convergence chassis.

2. Lay cabinet face down on soft surface to protect cabinet finish.

3. Remove blue beam positioning magnet and purity magnet assembly.

4. Disconnect ground lead between yoke and convergence coil assembly.

5. Loosen 3 thumb screws holding convergence coil and magnet assembly. Remove from neck of picture tube.

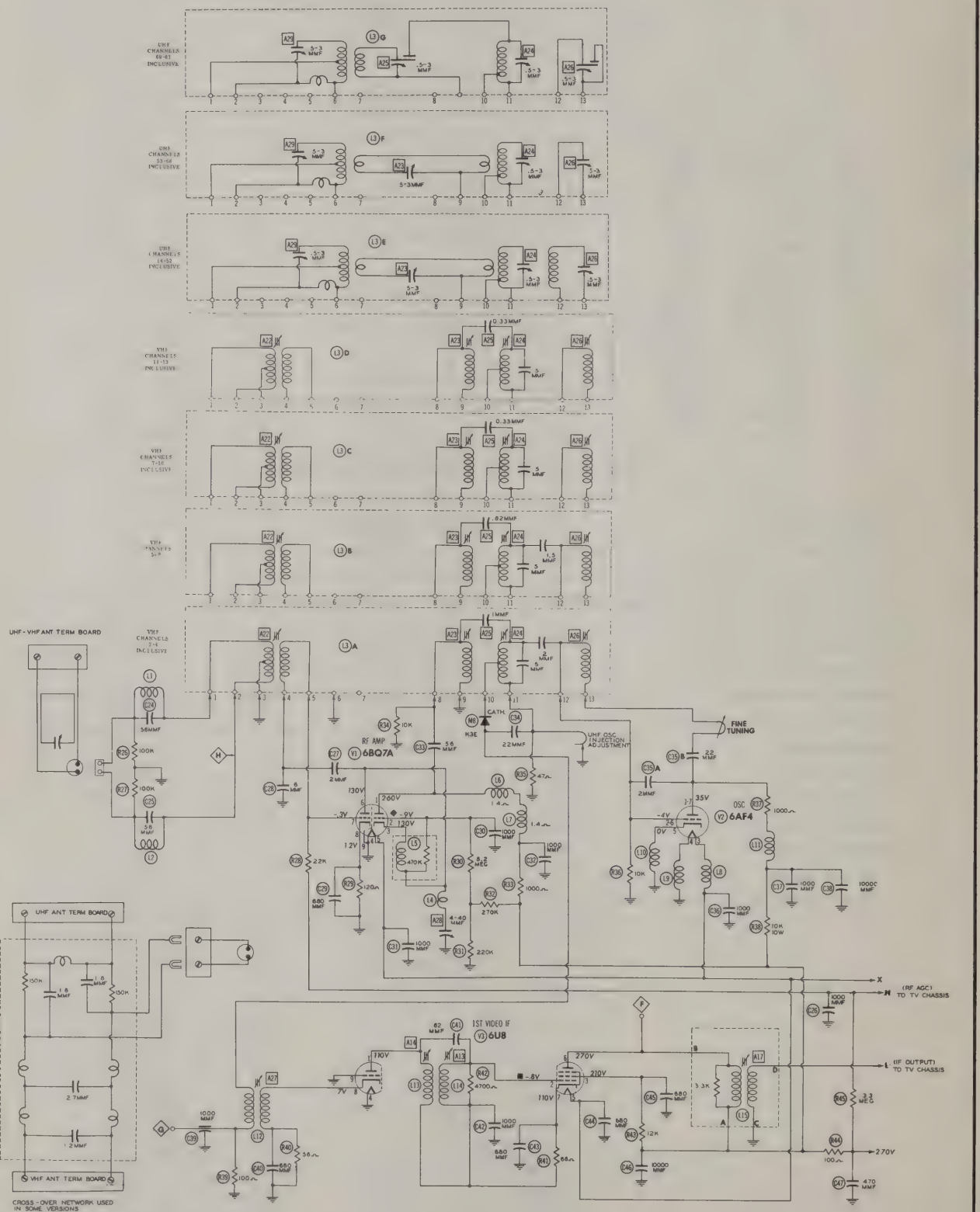
6. Loosen 4 retaining rod thumb screws and disengage rods from retaining ring. Remove retaining ring and yoke assembly from neck of tube.

7. Unclip ground lead to front mask trim. Loosen screw holding field equalizing magnet assembly.

8. Slide the equalizing magnet assembly from around front end of tube insulator and remove.

9. Lift insulating shield and HV lead from tube.

10. Lift picture tube up and out of cabinet.



RF TUNER SCHEMATIC

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MODEL 5160-2

SILVERTONE MODEL
5160-2 (Ch. 549.16100)

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SILVERTONE MODEL 5160-2 (Ch. 549.16100)

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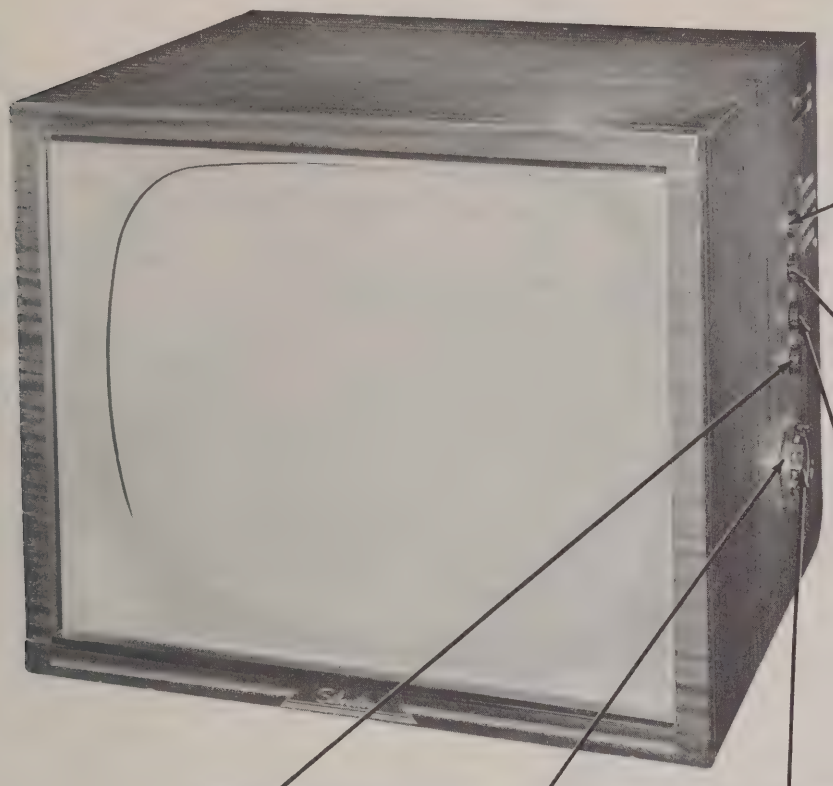

SILVERTONE MODEL 5160-2 (Ch. 549.16100)

TRADE NAME	Silvertone Model 5160-2 (Ch. 549.16100)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.08 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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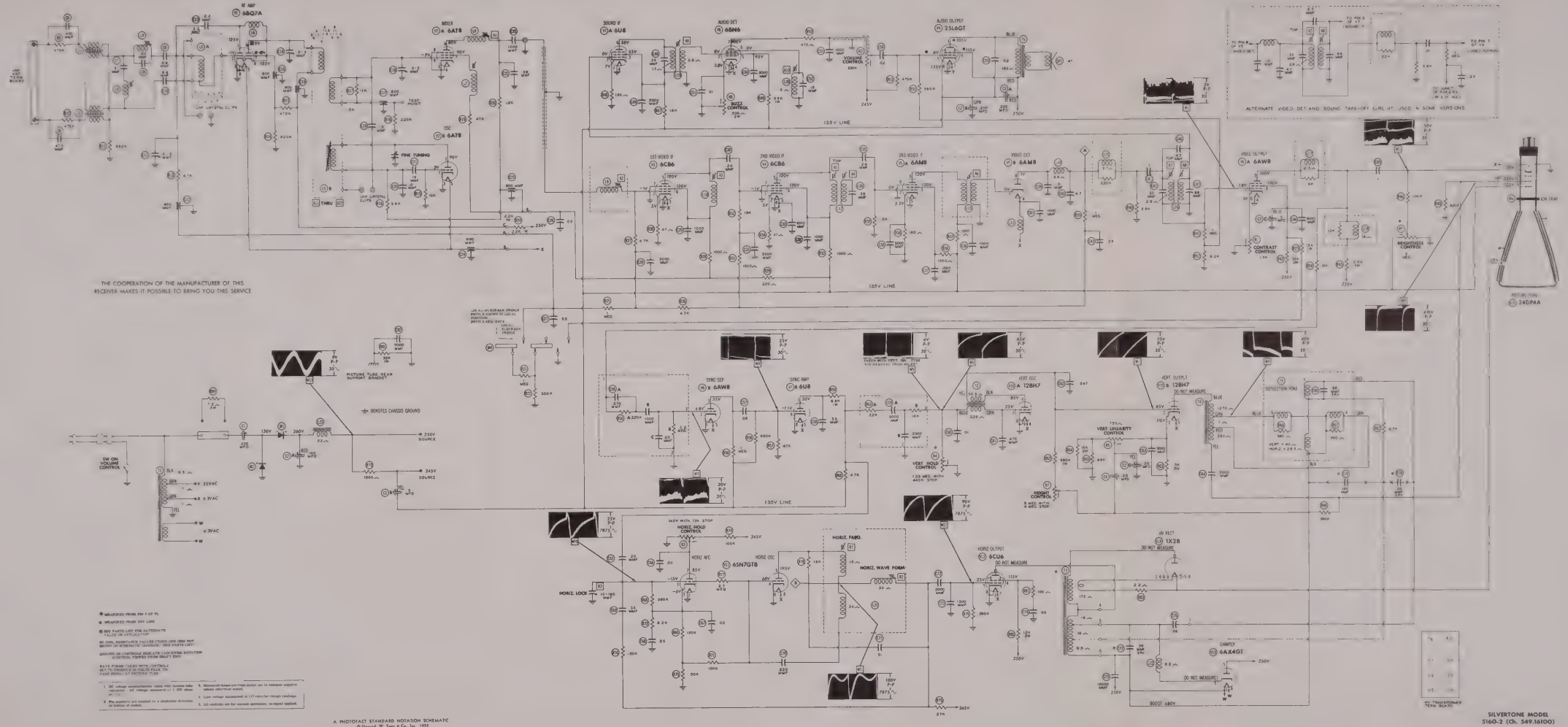
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
135V LINE
245V SOURCE
230V SOURCE
ALTERNATE VIDEO DET AND SOUND TAKE-OFF CIRCUIT USED IN SOME VERSIONS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SILVERTONE MODEL 5160-2 (Ch. 549.16100)

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CHASSIS TOP VIEW

SILVERTONE MODEL
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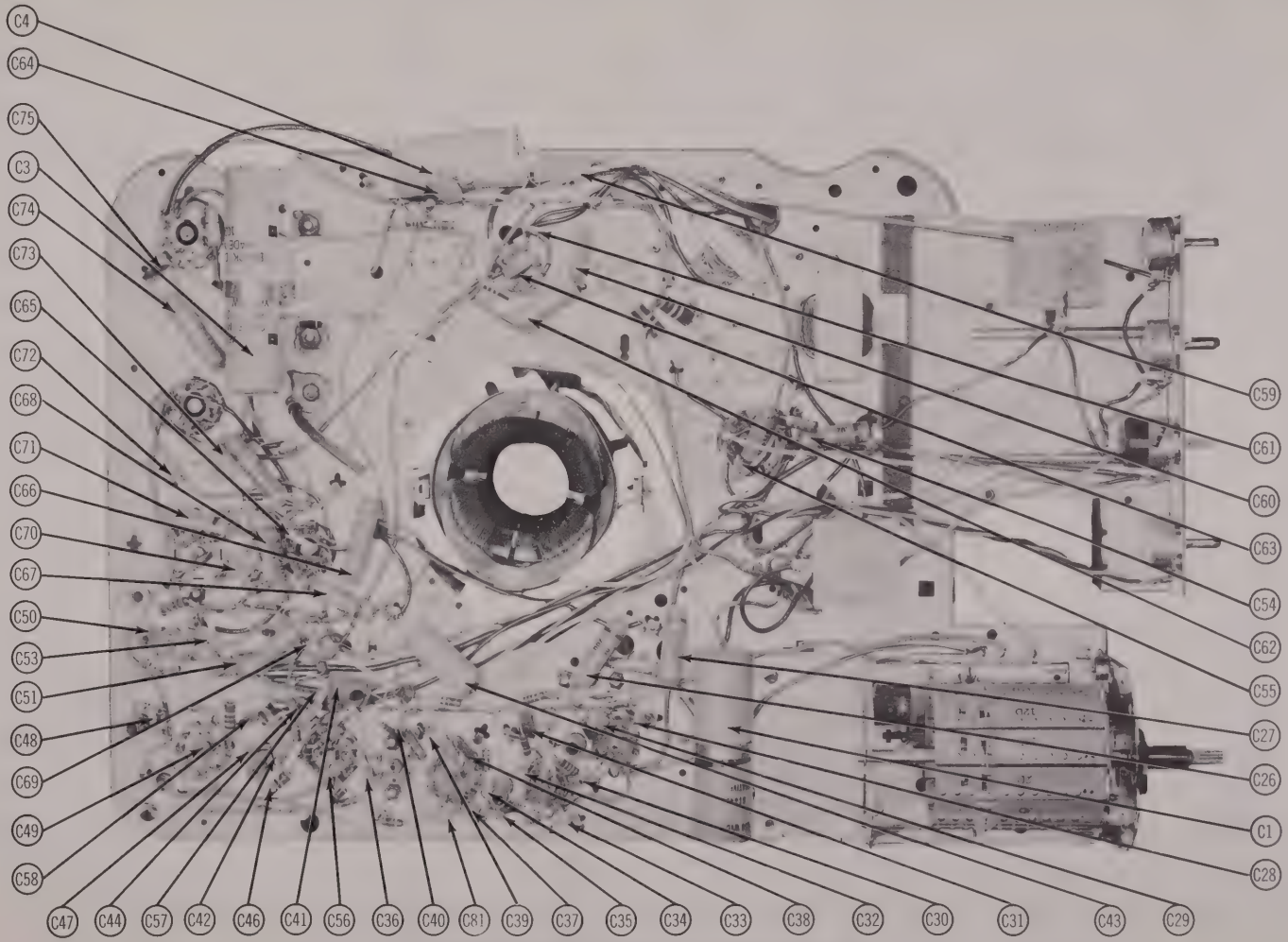
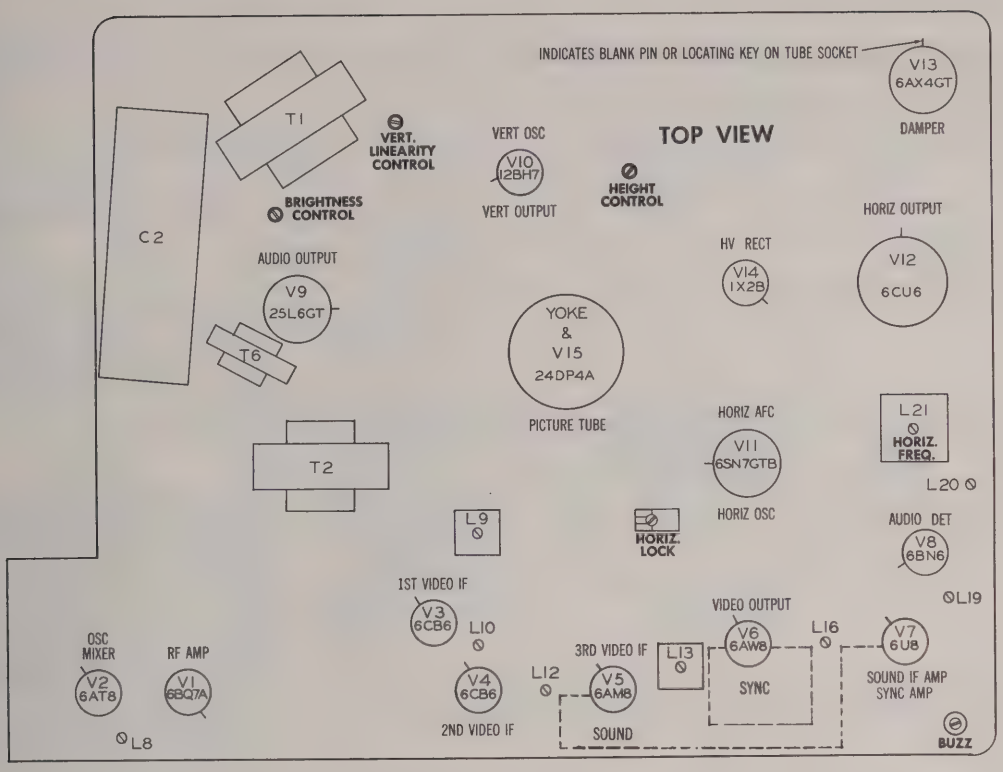


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V15
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V7, V10
No horiz. sync - V7, V11
No vert. or horiz. sync - V6, V7

SWEEP FAILURE
No raster, has sound - V11, V12, V13, V14, V15
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, V14, M1, M2
Vert. off freq. - V7, V10
Horiz. off freq. - V7, V11

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage shock hazard may be eliminated by removing the 6AX4 (V13) from its socket and connecting a 2250Ω/30 watt resistor from pin 3 to pin 5 of the tube socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C43. Connect the positive lead to chassis. Two peaks may occur during alignment of the video IF coil. Use the peak with slug entering the coil from the end nearest the chassis. The sound trap (A4) should be tuned to its minimum peak with the slug entering the coil from the end away from the chassis.
Set the channel selector switch between any two channels. This will disable the local oscillator and reduce the possibility of erroneous indications.
Attenuate generator output for 2 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	Between any two channels.	Vert. Amp. thru detector (Fig.3) to pin 5 (plate) of 6CB6 (V3). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1.
2.	"	"	"	"	"	Vert. Amp. thru 3.3KΩ to point (A). Low side to chassis.	A3, A4, A5, A6	Adjust for response similar to Fig. 2. Adjust A4 for MINIMUM marker amplitude at 41.25MC. A3 affects the high frequency end of response. A5 affects the low frequency end of the response curve. A6 affects center of response.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.001MFD	High side to point (A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any non-interfering channel	Vert. Amp. thru detector (Fig.4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Set volume control to its mid-range position. Set contrast control fully clockwise. Preset A7 so that slug is farthest from center of coil form. Adjust A7 for MINIMUM 400∿ indication on scope.
4.	"	"	4.5MC (15KC Swp)	4.5MC	"	Vert. Amp. across voice coil	A10	Turn buzz control (R8) 90 degrees from its maximum clockwise position. Attenuate generator output to give minimum useful indication on scope. Adjust A10 for maximum response at 4.5MC. Adjust volume control as necessary to maintain pattern size on scope.
5.	"	"	"	"	"	"	A8, A9	Attenuate generator output to maintain a signal level below the limiting action of the 6BN6. Adjust A8 and A9 for maximum response at 4.5MC.
6.	"	"	Not used	4.5MC (400∿Mod)	"	"	R8	Adjust buzz control (R8) for MINIMUM 400∿ indication on scope.
7.	"	"	4.5MC (15KC Swp)	4.5MC	"	"	A10	Set generator to give a strong signal and readjust A10 for maximum response at 4.5MC. Attenuate generator output for signal input below the limiting level of 6BN6 and repeat step 5.

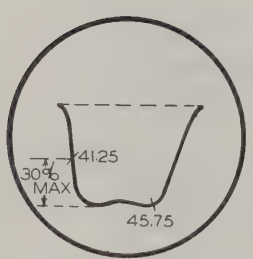


FIG. 1

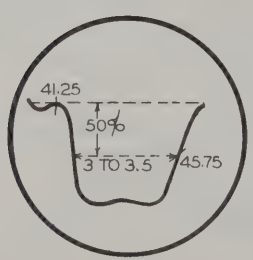


FIG. 2

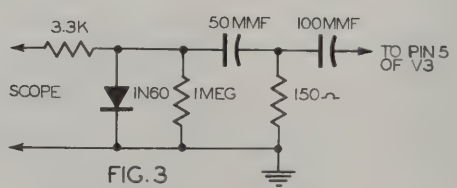


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING TV SIGNAL

Remove the 2250Ω resistor from pin 3 to pin 5 of V13 and replace the 6AX4 in its socket.
Tune the receiver to a TV station and connect an attenuator between the receiver and antenna so that the signal can be varied from weak to strong. If a suitable attenuator is not available stray feed the signal into the receiver by placing the antenna near the antenna terminals. Set the buzz control (R8) to its mid-range position.
Adjust A7, A8 and A9 for maximum program sound. If peaks appear at two different settings use the one at the farthest counter clockwise position. Apply a strong signal input to lowest useable level and check setting of A7, A8 and A9. Apply a strong signal and adjust A10 for maximum program sound. Apply a very weak signal and adjust R8 for minimum (buzz) noise.

OSCILLATOR ALIGNMENT

Leave bias battery connected as under "Video IF Alignment".
Remove the 2250Ω resistor from V13 tube socket (Pin 3 to Pin 5) and replace the 6AX4 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna leads with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 3.3KΩ to point (A). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

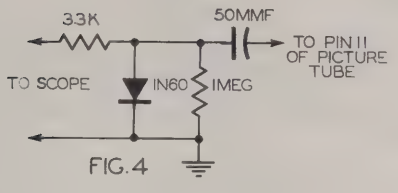


FIG. 4

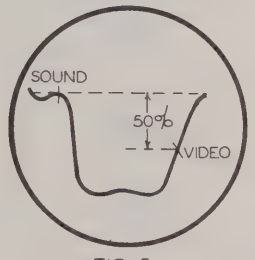


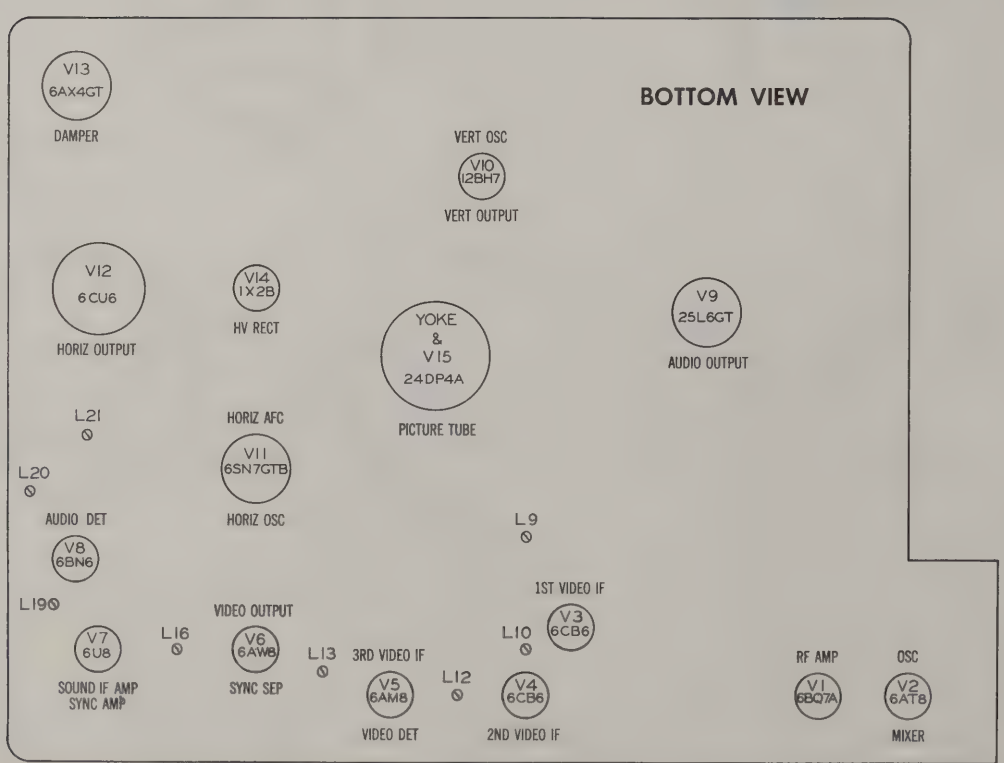
FIG. 5

SILVERTONE MODEL 5160-2 (Ch. 549.16100)

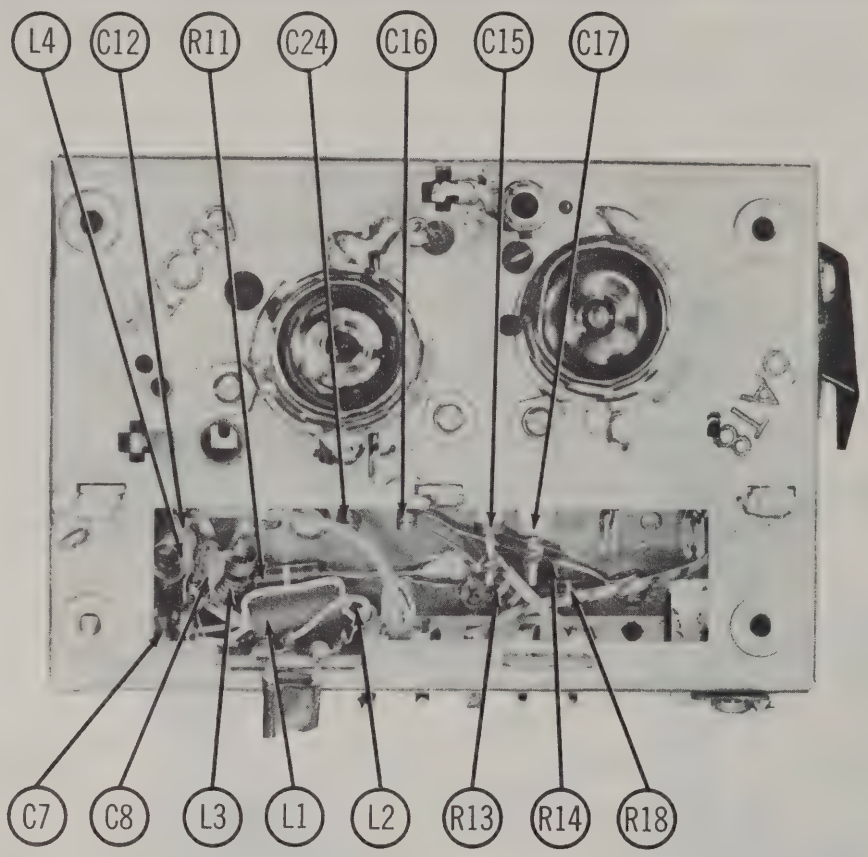
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	2Meg	0Ω	0Ω	. 1Ω	†2. 2KΩ	300KΩ	INF	300KΩ
V 2	6AT8	10KΩ	■3. 9KΩ	0Ω	0Ω	. 1Ω	†15KΩ	†47KΩ	0Ω	220KΩ
V 3	6CB6	1Meg	47Ω	. 1Ω	0Ω	■1. 2KΩ	■1. 2KΩ	0Ω		
V 4	6CB6	1Meg	47Ω	. 1Ω	0Ω	■1KΩ	■1KΩ	0Ω		
V 5	6AM8	180Ω	12KΩ	■1KΩ	. 1Ω	0Ω	■1KΩ	. 1Ω	5. 6KΩ	0Ω
V 6	6AW8	0Ω	2. 2Meg	■1Meg	0Ω	. 1Ω	160Ω	1Meg	†33KΩ	†5. 5KΩ
V 7	6U8	■11. 5KΩ	. 8Ω	■18KΩ	0Ω	. 1Ω	■18KΩ	150Ω	0Ω	47KΩ
V 8	6BN6	400Ω	3. 6Ω	0Ω	. 1Ω	■5. 6KΩ	5Ω	†330KΩ		
V 9	25L6GT	TP	0Ω	†250Ω	†53Ω	270KΩ	TP	1. 7Ω	100KΩ	
V 10	12BH7	▲1. 5KΩ	▲3Meg	7KΩ	. 1Ω	. 1Ω	▲3Meg	600KΩ	0Ω	0Ω
V 11	6SN7GTB	800KΩ	†100KΩ	300KΩ	250KΩ	†28KΩ	0Ω	0Ω	. 1Ω	
V 12	6CU6	TP	0Ω	NC	†12KΩ	390KΩ	NC	. 1Ω	0Ω	TOP CAP ▲21Ω
V 13	6AX4GT	NC	TP	150KΩ	NC	†53Ω	TP	150KΩ	150KΩ	
V 14	1X2B		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲200Ω
V 15	24DP4A	0Ω	0Ω	PIN 6 100KΩ	PIN 10 ▲350KΩ	PIN 11 ■250KΩ	PIN 12 . 1Ω			

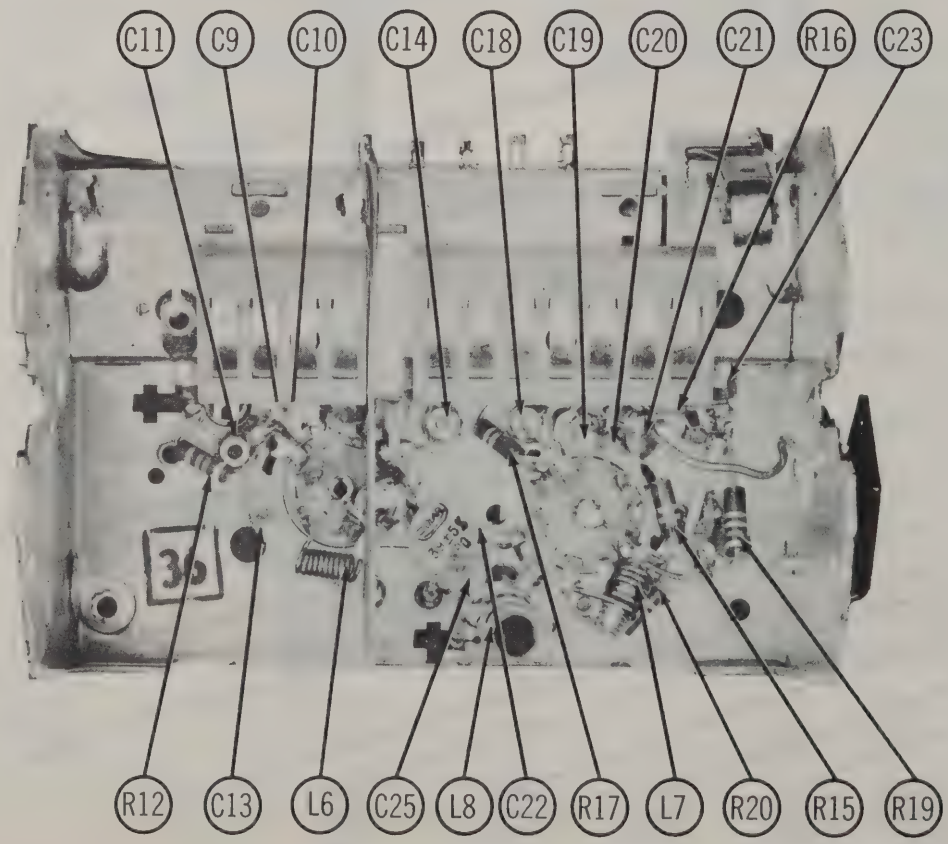
†MEASURED FROM OUTPUT OF M1.
■MEASURED FROM 135V LINE.
▲MEASURED FROM PIN 3 OF V13.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

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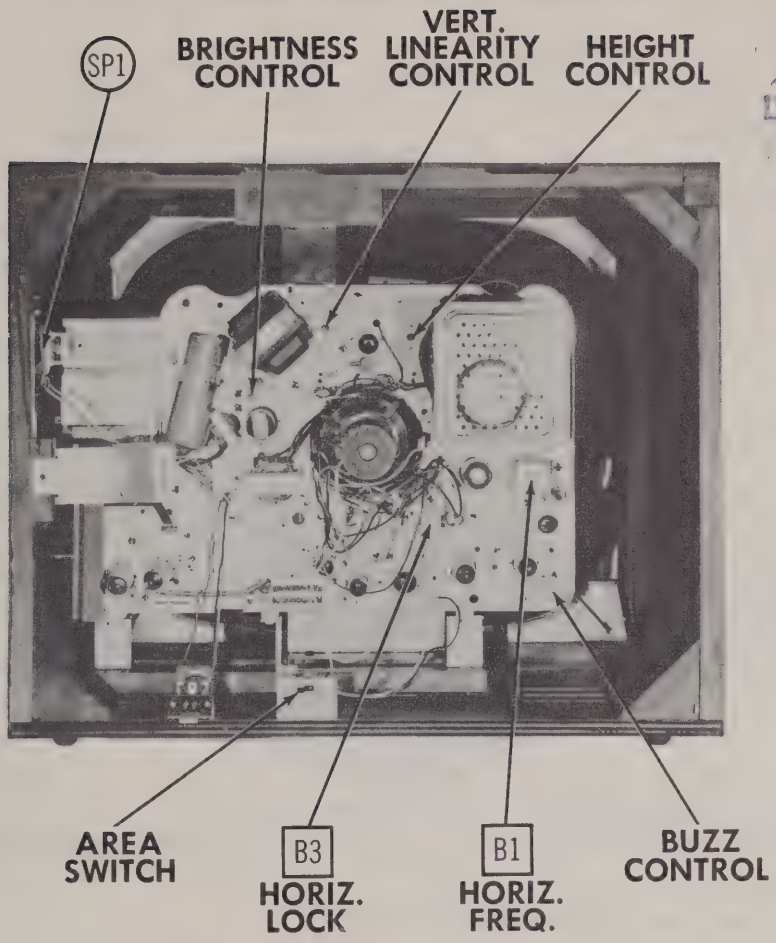
L. F. BLANKENSHIP
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Set the horizontal hold control to its mid-range position. Preset the horizontal lock trimmer (B3) on half turn from fully clockwise position.

Connect the vertical amplifier of an oscilloscope through a 10MMF capacitor to point Ⓑ. Low side to chassis. Adjust the horizontal frequency slug (B1), if necessary, to synchronize the picture horizontally. Then adjust the horizontal waveform slug (B2) for waveform similar to Fig. 6. If picture falls out of horizontal sync during adjustment of B2, keep the picture in sync with the horizontal hold control or B1. Disconnect scope from point Ⓑ.

Turn the horizontal hold control fully counter clockwise. Turn B1 counter clockwise until picture loses sync with diagonal bars sloping downward to the right. Adjust B1 clockwise until picture is just ready to fall in sync. Turn the horizontal hold control clockwise until picture loses sync. If picture is still in sync at maximum clockwise rotation of horizontal hold control, switch off channel and back again so that picture will fall out of sync. Turn the horizontal hold control slowly counter clockwise and note the number of diagonal bars present just before picture pulls into sync. If more than 3 bars are present adjust B3 slightly clockwise. If less than 2 bars are present adjust B3 slightly counter clockwise. Check horizontal hold control action. Picture should pull into sync within 60 degrees from fully counter clockwise rotation of horizontal hold control.

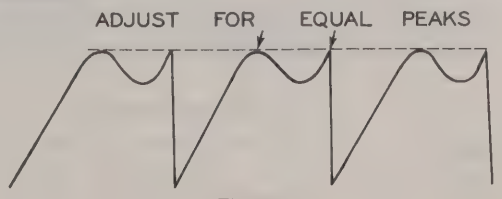


FIG. 6

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check M1 and M2. Check C72, C73, R80, R83, T3, T5A and other associated components.

DRIVE LINES

Check by substitution V12 and V13. Check C72, C73, R80, R84, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V12 and V13. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V11, V12 and V13. Check C68 and C67 for open. Check L21, R74, R3 and other associated components.

XMAS TREE EFFECT

Check by substitution V11, V12 and V13. Check T3 and T5 for internal arcing. Check L21, C69, C70, C71, R78 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V10. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C63, C4, R65, R64 and other associated components.	Check T2, C62, R62, R7 and other associated components.

INSUFFICIENT SWEEP

Substitute V10. Check height and vertical linearity controls for proper operation. Check R62, T4 and other associated components.

COMPRESSED AT BOTTOM

Substitute V10. Check T2, C62, R62, R7 and other associated components.

COMPRESSED AT TOP

Substitute V10. Check R63, R64, R65, R6, C4, C2D, T3, T5B, and other associated components.

FOLDS

Substitute V10. Check C62, C4, R64, R65, R63, T4, T5B and other associated components.

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V7. Check C56, C57, R56, R59, R60 and other associated components.

SYNC

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check vertical integrator network. Check C60, C61, T2, R4 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V11. Check C65, C67, C68, L21, R77, R74 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V7 and V11. Check components associated with V11.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C41, C44, C45, R42, R43 and other associated components.

SOUND BARS (4.5 MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A7. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check C41, C45, R42, R43, L17, L18 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check L15, L17, L18, C41, C45 and other associated components.

SMEAR

Substitute V6. Check L14, L15, L17, L18, R43, C41, C45 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stage V9 using audio signal generator. Apply audio signal across C53.

If Satisfactory	If Unsatisfactory
Check audio detector and audio IF stages for component failure or change of value.	Check C53, C54, C55, R50, R51, R53, T6 speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments A10 and R8 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound".

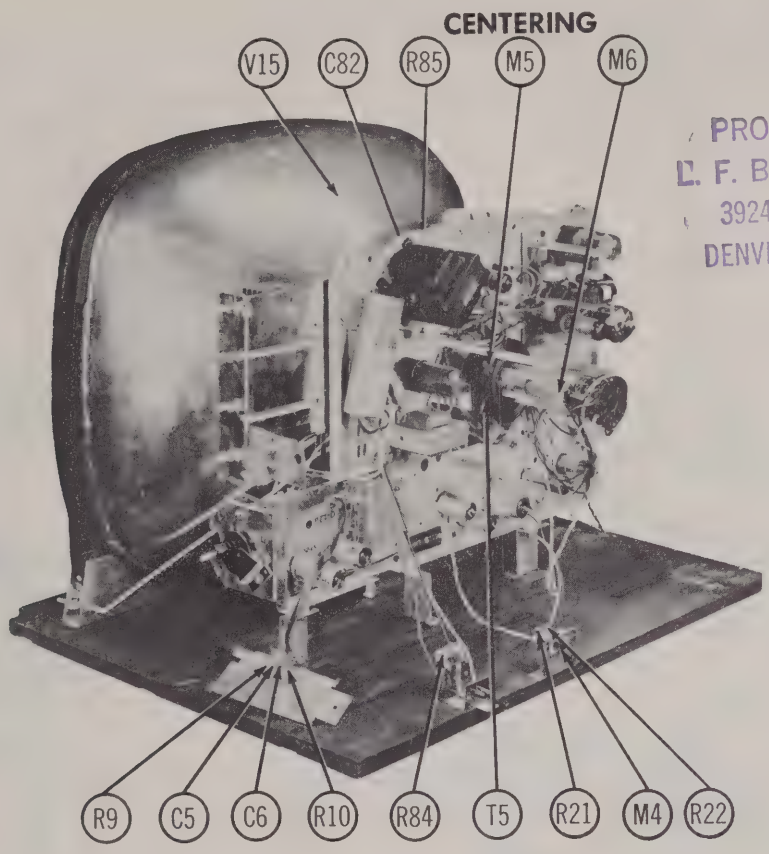
POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M1, M2, R84 and C1. Check B+ filter and decoupling network.

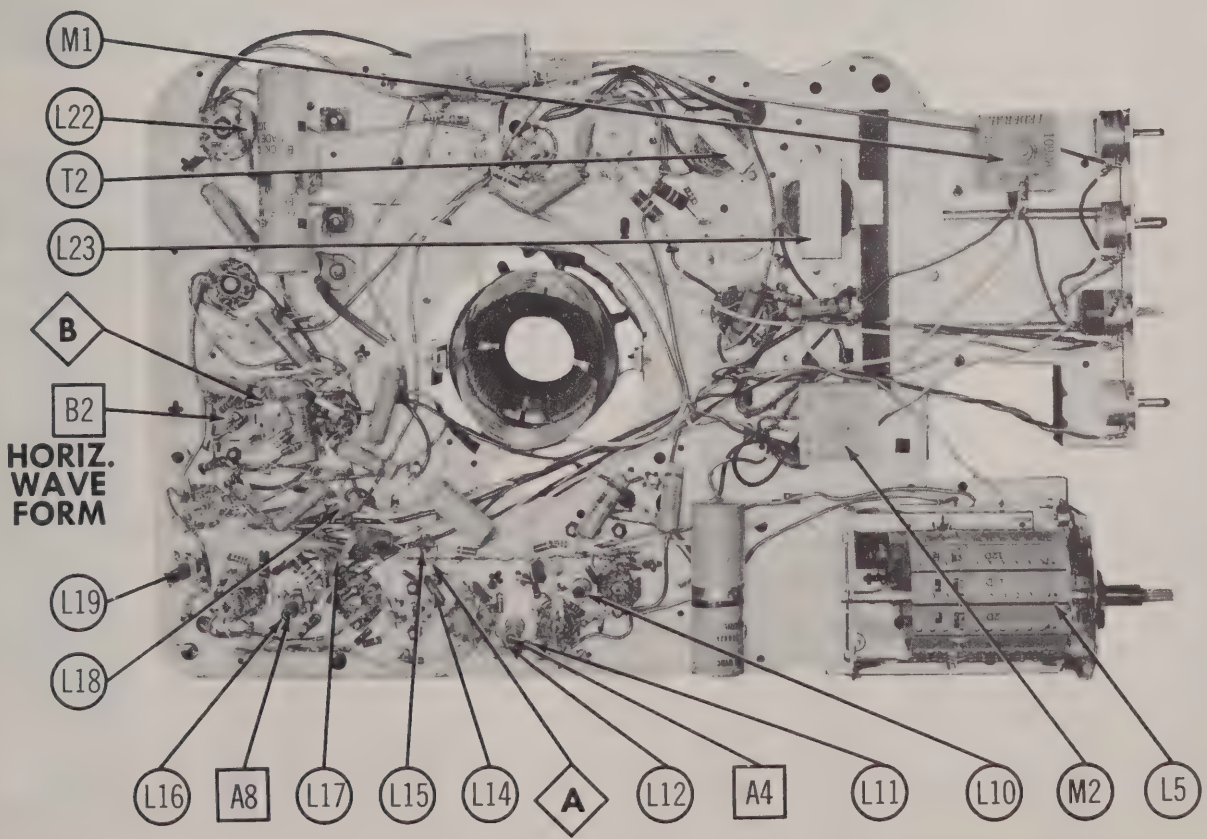
SMALL AND/OR DIM PICTURE

Check M1, M2, R84 and C1. Check B+ filter and decoupling network.



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS REAR VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: SILVERTONE PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BQ7A	6BQ7A	9AJ	
V2	Mixer-Osc.	6AT6	6AT6	9DW	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.- Video Det.	6AW8	6AW8	9CY	
V6	Video Output- Sync Sep.	6AW8	6AW8	9DX	
V7	Sound IF Amp. - Sync Amp.	6U8	6U8	9AE	
V8	Audio Det.	6BN6	6BN6	7DF	
V9	Audio Output	25L6GT	25L6GT	7AC	
V10	Vert. Osc.- Vert. Output	12BH7	12BH7	8A	
V11	Horiz. AFC- Horiz. Osc.	6SN7GTB	6SN7GTB	9BD	6SN7GT used as an alternate.
V12	Horiz. Output	6CU6	6CU6	8AM	
V13	Damper	5AX4GT	5AX4GT	4CG	
V14	HV Rect.	1X2B	8T	1X2B	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V15	24DP4A ①	24DP4A ①	24DP4A ①	24DP4A ③ 24DP4	24DP4A ① 24DP4	12L 12L	① Aluminized ③ Silver Screen

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: SILVERTONE PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	NOTES
C1	200	150	45B265	WB342	TD-200-200	B-110	
C2A	160	300	45B265	WQ605	CDB-1008	Q-162	
B	200	150					
C	5	300					
D	30	150					
C3A	200	150	45B312	WD345	TDL-205	D-088	
B	5	450					
C4	20	450	45B306	TC75	TD-20-450	FM-4520	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: SILVERTONE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	NOTES
C5	470	500	47X30B471M				
C6	470	500	47X30B471M				
C7	8			TCZ-4R7	NP0A-080	ZT-555	
C8	180			TCZ-181	N750A-331		
C9	6.8			TCZ-6R8	NP0A-6R8	ZT-5568	
C10	6.8			TCZ-6R8	NP0A-6R8	ZT-5568	
C11	5-12						
C12	800						
C13	3.3			TCZ-3R3	NP0A-3R3		
C14	.5-3			839-3	3U5-01-0R5	CT565A	
C15	800						
C16	800						
C17	800						
C18	.5-3			839-3	3U5-01-0R5	CT565A	
C19	1.5			TCZ-1R5	NP0A-1R5	ZT-5515	
C20	10			TCZ-10	NP0A-100	ZT-541	
C21	10			TCZ-10	NP0A-100	ZT-541	
C22	39			TCZ-39	NP0L-390		
C23	800						
C24	800						
C25	1000			DD-102	801-001	DC-521	
C26	.05	200	46AU503J	DF-503		PT415	
C27	.05	200	46AU503J	DF-503		PT415	
C28	5000		47A188	DD-502	81-006	DC-525	
C29	1000		47A330	DD-102	801-001	DC-521	
C30	24		47CA30A340J	TCN-24	N750K-340		
C31	5000		47A188	DD-502	81-006	DC-525	
C32	1000		47A330	DD-102	801-001	DC-521	
C33	1000		47A330	DD-102	801-001	DC-521	
C34	39			TCZ-39	NP0L-390		
C35	24		47CA30A340J	TCN-24	N750K-340		
C36	1000		47A330	DD-102	801-001	DC-521	
C37	1000		47A330	DD-102	801-001	DC-521	
C38	5000		47A188	DD-502	81-006	DC-525	
C39	10		47CA30100J	D5-100	GP1K-100	UC-541	
C40	4.7		47A180-S	TCZ-4R7	NP0A-4R7	ZT-5547	
C41	.1	150	46A343	DF-104		PT401	
C42	33		47A478				
C43	.25	100	46A343			PT4025	
C44	5000		47A188	DD-502	81-006	DC-525	
C45	.1	400	46AV104J	DF-104		PT401	
C46	4.7		47A180-S	TCZ-4R7	NP0A-4R7		
C47	68		47B479				
C48	33		47A478				
C49	5000		47A188	DD-502	81-005	DC-525	
C50	5000		47A188	DD-502	81-005	DC-525	
C51	.01	200	46AU103J	D5-103	GP3-333-103	PT401	
C52	15		47A480				
C53	1000		47A330	DD-102	801-001	DC-521	
C54	.02	300	46AU203J	DF-203	81T-02	PT412	
C55	.02	600	46AZ203J	DF-203	81T-02	PT612	
C56A	270		+49A048	+PC-263	81J-01	DC-5327	
B	10000				81J-01	DC-511	
C	25				831-250	DC-5425	
C57	.05	200	46AU503J	DF-503		PT415	
C58	33		47CA330A330M	D6-330	831-330	UC-5423	
C58A	5000		+49A044	+PC-106	81J-005	DC-525	
B	5000				81J-005	DC-525	
C60	.01	400	46BH103K4				
C61	470		47GX330S3K	D5-471	GP3K-471		
C62	.047	400	46BH473K4	DF-503			
C63	5000		47A188	DD-502	81J-005	DC-525	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No	CENTRALAB PART No	ERIE PART No	MALLORY PART No	NOTES
C64	5000		47A188	DD-502	81J-005	DC-525	
C65	20		47CA20G00K	D5-200	GP1K-200	Z7-542	
C66	.05	400	46AW503J	DF-503		PT415	
C67	.02	200	46AW203J	DF-203	81T-02	PT412	
C68	.25	100	46A342			PT4025	
C69	33		47A478				
C70	220	500	47X30B221K	TCZ-220	NP0-335-221		
C71	.01	400	46C244	D5-103	GP3-333-103	PT411	
C72	20000		47A242	DD-203	81T-02	PT412	
C73	1500	500	47X30B152K			PT415	
C74	.05	400	46AW503J	DF-503		PT415	
C75	1000		47A324	DD-103	81J-01	DC-511	
C76	.08	200	46AU803F			DC-5327	
C77	56	3000	47A555	DD30-560	3KV-560	DC30456	Note 1
C78	100	3000		DD30-101	3KV-101	DC3031	Note 1
C79	100	3000		DD30-101	3KV-101	DC3031	Note 1
C80	68	3000		DD30-680	3KV-680	DC30468	
C81	1000		47A330	DD-102	801-001	DC-521	
C82	5000		47A485	DD-502	81J-005	DC-525	

* Items C56A, C56B, C56C, R55A and R55B are combined in one unit.
† Items C59A, C59B, R61A and R61B are combined in one unit.
Note 1. When C77 is used, items C78 and C79 are omitted.

CONTROLS

ITEM No	RATING: RESIST ANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	25B1102	Q1T-109		AB-515	U-5	Contrast
B	Shaft		Not Req.	Not Req.		AB-3	Not Req.	Attach to R1A.
R2A	350Ω	½	25B1101	Q1S-125	A47-500X-Z	B-80-S	TA35A	Volume
B	Shaft		Not Req.	Not Req.	F2-3	Not Req.	Not Req.	Attach to R2A.
C	Switch		Not Req.	T6-1	SWZ-13	Not Req.	U2-26	Attach to R2A.
R3A	145KΩ	½	25B1100	Q1J-125-S	A47-75K-S	B-35-S	U-43	Horizontal Hold (Stop at 75KΩ)
B	Shaft		Not Req.	Not Req.	F2-3	Not Req.	Not Req.	Attach to R3A.
R4A	1.25Meg	½	25B1097	Q1J-135T	A47-1Meg-S†	B-09†	TA35J†	Vertical Hold (Fixed Minimum 440KΩ)
B	Shaft		Not Req.	Not Req.	F2-3	Not Req.	Not Req.	Attach to R4A.
R4	1.25Meg	½	25B1176					Vertical Hold-See Note 1
R5A	5Meg	½	25B1096	Q1T-141			TA25GR	Brightness
B	Shaft		Not Req.	TQ			Not Req.	Attach to R5A.
R5	5Meg	½	25A1096					Brightness-See Note 1
R8A	750Ω	½	25B1099	Q1J-105	A47-750-S	AB-5	TA25LL	Vertical Linearity
B	Shaft		Not Req.	TQ		AB-19	Not Req.	Attach to R8A.
R7A	5Meg	½	25B1098	Q1J-141-S	A47-4Meg-S*	AB-85*	TA25SL*	Height Stop at 4Meg
B	Shaft		Not Req.	TQ		AB-19	Not Req.	Attach to R7A.
R8	500Ω	2	25A1095		39-500			Buzz (Wire Wound)

Note 1. Used as an alternate in some versions.
* Connect a 68KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
† Connect a 430KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
* Connect a 1Meg resistor in series with the center terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT.	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R9	470KΩ	½	23X30X474X	BTS-470K	
R10	470KΩ	½	23X30X474X	BTS-470K	
R11	680KΩ	½	23X30X684X		
R12	4700Ω	½	23X30X472X	BTS-4700	
R13	470KΩ	½	23X30X474X		
R14	330KΩ	½		BTS-3300	
R15	10KΩ	½			
R16	3300Ω	½			
R17	15KΩ	½	23X30X153X		
R18	220KΩ	½			
R19	47KΩ	½	23X30X473X		
R20	15KΩ	½	23X30X153X		
R21	1Meg	½	23X30X105X	BTS-1Meg	
R22	330KΩ	½	23X30X334X	BTS-330K	
R23	15KΩ	1	23X30X153X	BTA-15K	
R24	2200Ω	1	23X30X222X	BTA-2200	
R25	1Meg	½	23X30X105X	BTS-1Meg	
R26	4700Ω	½	23X30X472X	BTS-4700	
R27	4700Ω	½	23X30X472X	BTS-4700	
R28	1000Ω	½	23X30X102X	BTS-1000	
R29	330Ω	½	23X30X331X	BTS-330	
R30	47Ω	½	23X30X470X	BTS-47	
R31	1000Ω	½	23X30X102X	BTS-1000	
R32	33KΩ	½	23X30X183X		
R33	1000Ω	½	23X30X102X	BTS-1000	
R34	47Ω	½	23X30X470X	BTS-47	
R35	12KΩ	½	23X30X123X		
R36	1000Ω	½	23X30X102X	BTS-1000	
R37	1000Ω	½	23X30X102X	BTS-1000	
R38	180Ω	½	23X30X181X	BTS-180	
R39	1Meg	½	23X30X105X	BTS-1Meg	
R40	54000Ω 5%	½	23X30X563X		
R41	1Meg	½	23X30X105X		
R42	33KΩ	3	23X40X333X	BTS-33K	
R43	5600Ω	5	24B1046		
R44	390KΩ	½	23X30X394X		
R45	820KΩ	½	23X30X824X		
R46	100KΩ	½	23X30X104X		
R47	18KΩ	½	23X30X183X	BTS-18K	
R48	150Ω	½	23X30X151X	BTS-150	

ITEM No.	RATING: OHMS	RATING: WATT.	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R49	5600Ω	½	23X30X562X	BTA-5600	
R50	470Ω	½	23X30X471X	BTS-470	
R51	5620Ω 5%	½	23X30X564J	BTS-5600 5%	
R52	8200Ω	½	23X30X822X	BTS-8200	
R53	470KΩ	½	23X30X474J	BTS-470K	
R54	15KΩ	½	23X30X153X		
R55A	220KΩ	½	+49A046		
B	2.2Meg	½			
R56	1Meg	½	23X30X105X		
R57	47K	½	23X30X474X		
R58	6800Ω	½	23X30X684X	BTS-680K	
R59	6800Ω	½	23X30X682X		
R60	4700Ω	½	23X30X472X		
R61A	22KΩ	½	+49A044		
B	10KΩ	½			
R62	680KΩ	1	23X30X684X		
R63	15KΩ	3	23X40X153X		
R64	15KΩ	3	23X40X153X		
R65	68KΩ	½	23X30X683X		
R66	560Ω	½		BTS-560	
R67	560Ω	½		BTS-560	
R68	560KΩ	½	23X30X564X		
R69	150KΩ	½	23X30X154X		
R70	100KΩ	½	23X30X154X		
R71	100KΩ	½	23X30X104X		
R72	8200Ω	½	23X30X822X	BTS-8200	
R73	1000Ω	½	23X30X102X	BTS-1000	
R74	100KΩ	½	23X30X104X		
R75	270Ω	½	23X30X271X		
R76	150KΩ	½	23X30X154X		
R77	7.7Meg	½	23X30X775X	BTS-7.7Meg	
R78	18KΩ	½	23X30X183X		
R79	390KΩ	½	23X30X394X		
R80	12KΩ	3	23A097		
R81	100Ω	½	23X30X101X		
R82	4700Ω 5%	½	23X30X472X	BTS-4700 5%	
R83	2.2Ω	3		BW-2.2	
R84	7.2Ω	5	25B101		
R85	33KΩ	1	23X30X333X	BTA-33K	

* Items C56A, C56B, C56C, R55A, R55B are combined in one unit.
† Items C59A, C59B, R61A and R61B are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	6.3VAC @ 5A tap @ 2.3A 25VAC @ .32A tap @ 6.3VAC @ 5.8A		52C322					26F54	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	55B250		A-3008					
T3	Horiz. Output Trans.	55Q270 55Q274 ①	FB418 * FB418	HVO-37 * HVO-37		X133 * X133	A-8263 * A-8263	FLY-25* FLY-25	D-48 * D-48
T4	Vert. Output Trans.	55C280		A-2824					
T5A	Yoke (90°) Horiz. (20MH)	53D325	DF50T② ③④	MDF-92 ②③④	25SD1 ②③④		DY-18A ②③④	Y-16 ④③④	Y-41-1 ④③④
B	Vert. (40MH)								

① Alternate Silvertone part number.
② Use original rear cover and centering device.
③ Use original horizontal damping network.
④ Jumper terminals #3 and #5.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	5	6	3	6	6	6	6
5	3	3	7	3	3	3	3
6	2	2	6	2	2	2	2

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	IMPEDANCE: SEC	SILVERTONE PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T6	2.4KΩ	3.1Ω	55D248	Z-101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No	QUAM PART No	NOTES
SP1	4"	PM	3.1Ω	85C175	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Match. Trans.	0Ω	0Ω					
L3	Ant. Match. Trans.	0Ω	0Ω					
L3	IF Trap	0Ω						
L4	IF Trap	.1Ω						
L5A	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2934				Channel 3
B	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2935				Channel 5
C	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2936				Channel 4
D	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2937				Channel 6
E	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2938				Channel 8
F	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2939				Channel 7
G	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2940				Channel 9
H	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2941				Channel 9
I	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2943				Channel 10
J	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2942				Channel 11
K	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2944				Channel 13
L	Ant. RF Mixer Grid							
	Osc. Coils	0Ω		5A2945				Channel 12
L6	Neut. Coil	0Ω						
L7	RF Choke	0Ω						
L8	Conv. Plate	.1Ω						
L9	1st. Video IF	.1Ω		51A1926	17-4504 *	TV-135 ■	6234 ■	
L10	2nd. Video IF	.1Ω		51A1925	17-4502 *	TV-131	6233	
L11	Fil. Choke	0Ω		53A282	19-5001		6172	
L12	3rd. Video IF	.1Ω		51B1948	17-4501	TV-133	6231 ▲	.4 Microhenry
L13	4th. Video IF	.1Ω	.1Ω	50A654	17-5004 ▲	TV-135 ■	6234 ■	Includes 41.25MC trap

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L14	Series Peaking Coil	4.4Ω		53A307	19-1006		4624	16 Microhenries
L15	Series Peaking Coil	5.7Ω		51A1952	19-3075 ♦		6172 ♦	68 Microhenries, wound on 220KΩ resistor
L16A B	4.5MC Trap 1st. Sound IF	2.9Ω .8Ω		51A1996				
L17	Series Peaking Coil	12.5Ω		51A1947	19-3500 †		6144 †	575 Microhenries, wound on 18KΩ resistor
L18	Shunt Peaking Coil	18Ω		51A1997	19-5100 #		4642 ¶	1070 Microhenries, wound on 12KΩ resistor
L19	2nd. Sound IF	1.7Ω	3.6Ω	51A1859				
L20	Quadrature Coil	5Ω		51A1857	20-1005	TV-151	1480	
L21	Horiz. Osc.	15Ω	34Ω	50C648	20-1402 ††	TV-162 ††	6183 ††	Waveform winding -35Ω
L22	RF Choke	6.2Ω		53A342				7.5 Microhenries IRC part #CLA

* Detune trap winding.
■ Use one winding and use adaptor plate.
▲ Use one winding only.
▰ Use adaptor plate.
♦ Parallel with 220KΩ resistor.
† Parallel with 18KΩ resistor.
# Wound on 10KΩ resistor.
¶ Parallel with 12KΩ resistor.
†† Reverse coil mounting in can.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L23	.180A DC	53Ω	.85HY	57B187	C5040	C-2994	C-2327	26C41	C-21X ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.180A DC	27A218	1090A	MR-300	6S300	6Q4	300	
M2	.180A DC	27A218	1090A	MR-300	6S300	6Q4	300	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuner	1D2249	VHF
M4	Switch	60A693	AGC (3 Position-Slide Type)
M5	Centering Device		Part of deflection yoke rear cover (T5)
M6	Ion Trap	21B189	
B3	Trimmer Cap.	44A448	Horiz. Lock (10-160MMF)
	Cabinet	78A1206	
	Knob	15A769	Channel Selector
	Knob	15C775	Horiz. Hold, Vert. Hold, Contrast, On-Off-Volume
	Knob	15C762	Fine Tuning
	Safety Glass	22A455	
	Mask	7A611	

TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V11, V12, V13 and V14. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T3, T5, C74, C75, C76, C77, R80, R83 and other associated components.	Check L21, C66, C69, C70, C71, C72, R74, R75, R78 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V12 and V13. Check M1 and M2. Check R80, R83, C72, C73, T3, T5A and other associated components.

BLOOMING

Check by substitution V12, V13 and V14. Check C72, C73, C76, R80, R83, T3, T5A and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or no Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 5 wood screws holding plastic strip at the top of the safety glass. Remove plastic strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See Tube Placement Chart on Page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control (R8) located on top of chassis for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.
2. Remove 6 wood screws. Remove rear cover.
3. Remove 1 wood screw. Remove antenna bracket.
4. Disconnect speaker leads.
5. Remove 2 wood screws from upper chassis mounting brace (holds chassis to top of cabinet).
6. Remove 2 wood screws holding corner braces to mounting board. Remove 9 wood screws from under chassis mounting board. (Note: Do not remove chassis mounting bolts).
7. Lift cabinet up and off of mounting board.
8. Remove 2 wing nuts. Remove speaker.

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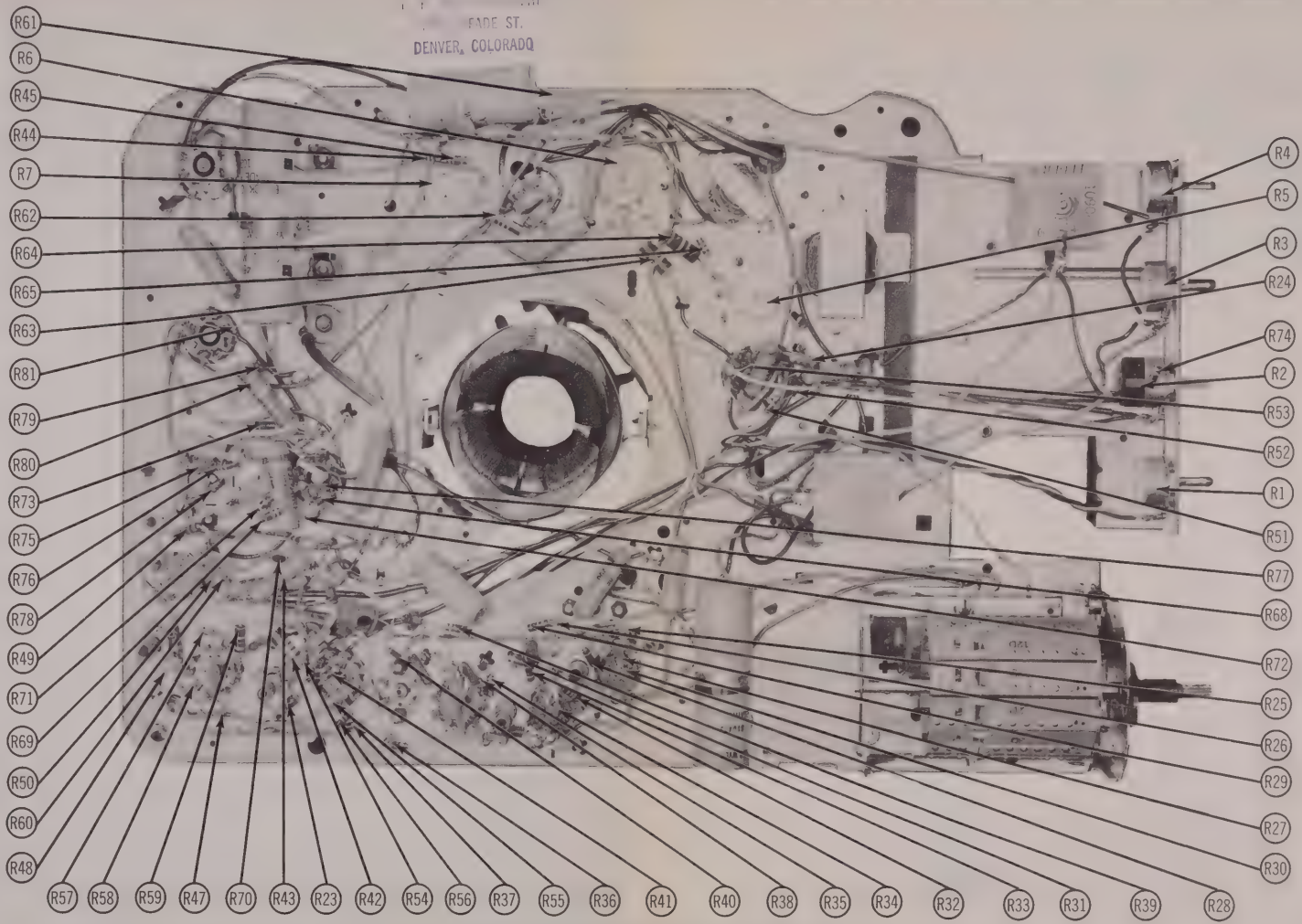

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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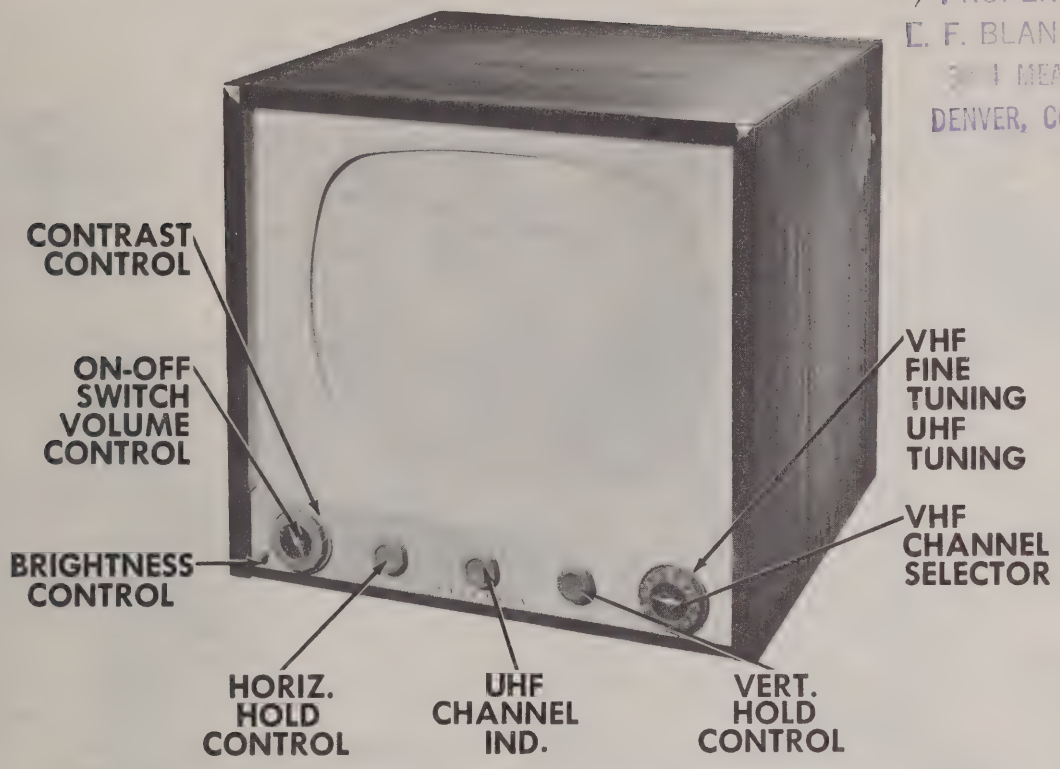

SYLVANIA MODEL 612 "U" SERIES

TRADE NAME	SYLVANIA	MODELS	CHASSIS
		614 Series	1-526-1
		614 "U" Series	1-526-2
		21T103, 612 Series	1-526-3
		21T103 "U", 612 "U" Series	1-526-4
		21C402, 622 Series	1-526-5
		21C402 "U", 622 "U" Series	1-526-6

MANUFACTURER	Sylvania Electric Product, Inc., Radio & Television Div., 254 Rano St., Buffalo 7, N. Y.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.4 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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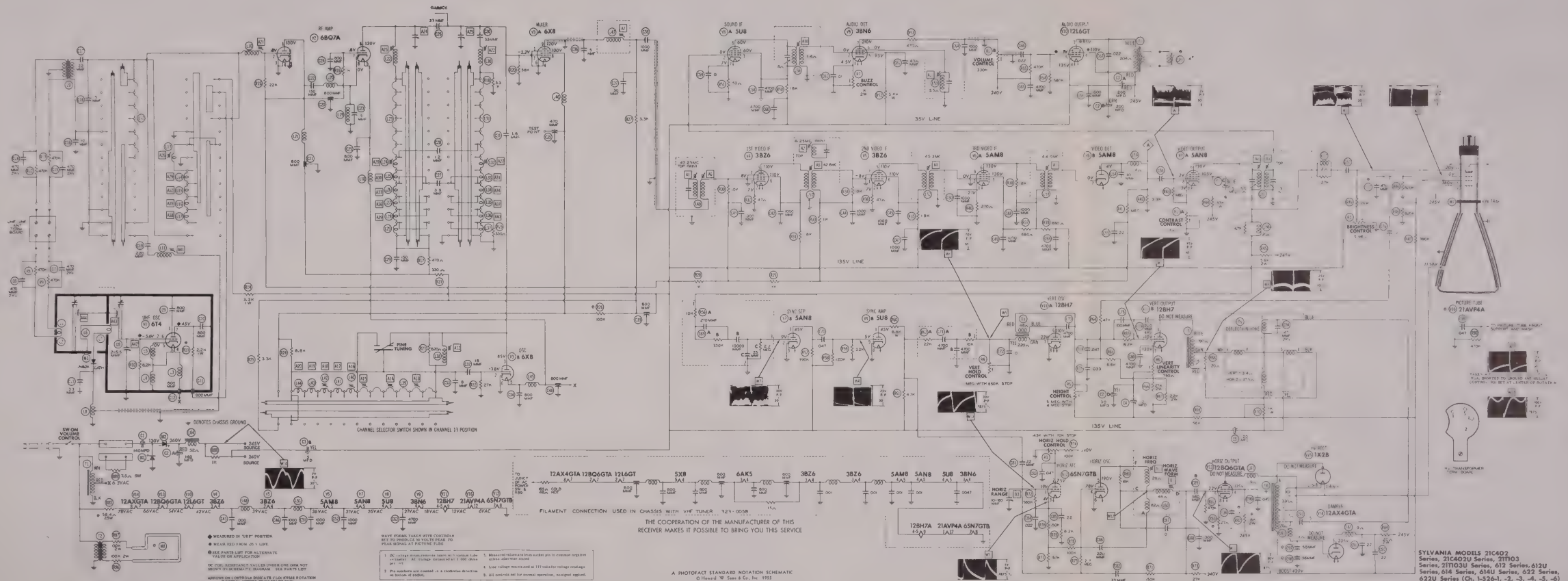
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THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
FILAMENT CONNECTION USED IN CHASSIS WITH VHF TUNER 323-0058
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
135V LINE
35V LINE
12AX4GTA 12BQ6GTA 12L6GT 5X8 6AK5 3BZ6 3BZ6 5AM8 5AN8 5U8 3BN6
12BH7A 21AVP4A 65N7GTB

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CHASSIS TOP VIEW

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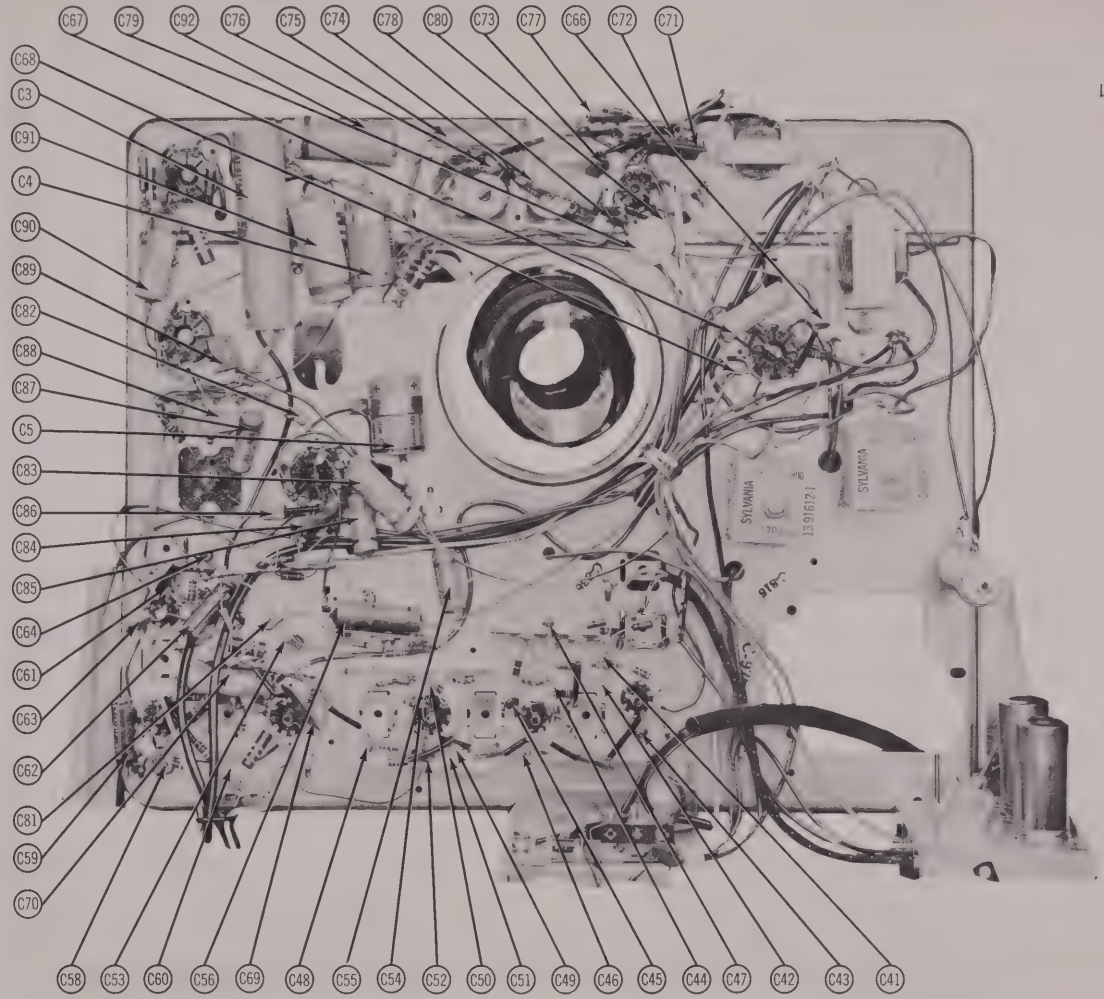

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply to the ungrounded side of C55. Connect the positive lead to chassis. Use non-metallic alignment tools. If the marker generator is a separate unit from the sweep generator, loosely couple marker generator to sweep generator output. Use low marker output.
Adjust A1, A2, A5 and A6 starting with slugs counter clockwise from coil turns. Keep all leads from generators and scope shielded and short as possible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	Not used	47.25MC (Unmod)	Any non-interfering high channel	Use VTVM. DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection. Use high signal generator output.
2.	"	"	"	41.25MC	"	"	A2	"
3.	"	"	"	44.0MC	"	"	A3	Attenuate generator output to maintain 1 to 2 volts on VTVM. Adjust for maximum deflection.
4.	"	"	"	45.3MC	"	"	A4	"
5.	"	"	"	42.6MC	"	"	A5	"
6.	.001MFD	High side to pin 1 (grid) of 3BZ6 (V4). Low side to chassis.	43.5MC (10MC Swp)	42.4MC 45.75MC	"	Vert. Amp. thru 33KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A3, A4 and A5 to obtain desired response. A4 affects high frequency side of response curve. A5 affects low frequency side. Adjust A3 for maximum amplitude with MINIMUM tilt. Repeat steps 1 and 2.
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low sides to chassis.	"	41.25MC 42.6MC 45.75MC 47.25MC	"	"	A6, A7	Adjust A6 and A7 for response similar to Fig. 2. If necessary, retouch A3, A4 and A5 for correct tilt and position of 45.75MC and 42.6MC markers. Increase sweep generator and scope output to observe 41.25 MC and 47.25MC trap markers. If necessary, retouch A1 and A2 to place correct markers 47.25MC and 41.25MC in trap notch as in Fig. 2. Remove bias and test equipment.

4.5MC TRAP ALIGNMENT

Set volume control at low volume level.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to pin 8 (grid) of 5AN8 (V7A). Low side to chassis.	4.5MC (400∿Mod)	Any non-interfering channel	Vert. Amp. thru detector (Fig.3) to pin 11 (cathode) of picture tube. Low side to chassis.	A8	Use high generator output. Adjust A8 for MINIMUM indication on scope.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR, AM SIGNAL GENERATOR AND OSCILLOSCOPE

Set volume control at low volume level.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 8 (grid) of 5AN8 (V7A). Low side to chassis.	4.5MC (400∿ Mod) (50KC Swp)	4.5MC	Any non-interfering channel	Across secondary of audio output transformer.	A-11	Set buzz control (R7) 60 degrees from maximum clockwise rotation. Adjust A-11 for maximum 400∿ indication on scope.
10.	"	"	"	"	"	"	A10, A9	Attenuate generator output so that signal level is below the limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A10 and A9 for maximum response on scope.
11.	"	"	Not used	4.5MC (400∿Mod)	"	"	R7	Use high signal generator output and adjust R7 for MINIMUM 400∿ indication on scope.
12.	"	"	4.5MC (400∿Mod) (50KC Swp)	4.5MC	"	"	A-11	With volume control at low level retouch A-11 for maximum 400∿ indication on scope. Tune in a TV station with weakest signal and retouch R7 for MINIMUM hiss and background noise. Tune in strongest station and retouch A-11 for best sound.

ALTERNATE SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Preset buzz control (R7) to its mid-range position. Turn the set on and tune in a TV signal. Reduce the signal strength into the receiver by inserting an attenuator in series with the antenna and receiver antenna terminals. If a suitable attenuator is not available, remove the antenna from the antenna terminals and stray feed the signal into the receiver by placing the antenna near the antenna terminals of the receiver. Adjust A9 and A10 for maximum volume. Reconnect antenna for a strong signal and adjust A-11 for maximum volume. Reduce signal input and adjust R7 for minimum noise and buzz. Reconnect antenna and retouch A-11 for maximum volume. If necessary, reduce volume so that this peak can be heard.

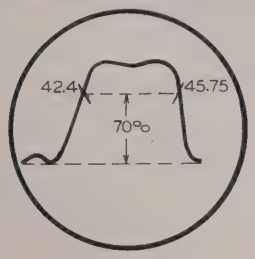

FIG.1

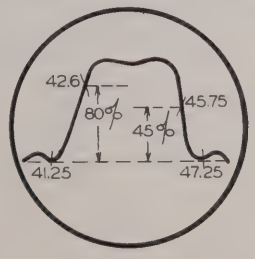

FIG.2

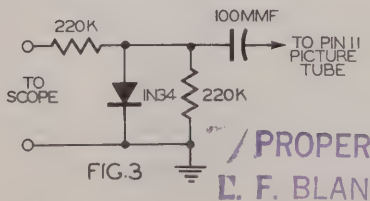

FIG.3

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ALIGNMENT INSTRUCTIONS (cont)

VHF TUNER OSCILLATOR ALIGNMENT FOR VHF AND VHF/UHF CHASSIS

Use as isolation transformer to protect the test equipment.
Use only enough sweep generator output for useable pattern on scope. Use high scope gain.
Keep leads from test equipment to tuner alignment connections short as possible. Leads between chassis and alignment equipment should be shielded.
Tuner shield should be kept in place.
Connect the negative lead of a 2.5 volt bias supply to junction of green wire to tuner and R28. Connect the positive lead to chassis.
Unsolder primary of L50 from pin 5 of V4. Connect a 330Ω resistor from pin 5 of V4 to the B+ end of L50 (terminal #4 on L50).
During alignment, the use of two marker generators is required. Generator #1 (IF) is coupled loosely to one side of the antenna terminals. If sweep generator has a built-in marker generator, it should be used as marker generator #2 (RF). If not, connect a second marker generator (RF) to other side of the antenna terminal, coupled loosely. Use low marker generator output to avoid distortion of response curve.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead	213MC (10MC Swp)	211.25MC (RF marker) 45.75MC (IF marker)	13	Vert. Amp. thru detector (Fig.4) to pin 5 (plate) of V4. Low side to chassis.	A12	Adjust so that RF and IF markers coincide as in Fig. 5. Curves may not be symmetrical until RF alignment is complete.
14	"	"	201MC (10MC Swp)	199.25MC 45.75MC	11	"	A13	"
15	"	"	189MC (10MC Swp)	187.25MC 45.75MC	9	"	A14	"
16	"	"	177MC (10MC Swp)	175.25MC 45.75MC	7	"	A15	"
17	"	"	85MC (10MC Swp)	83.25MC 45.75MC	6	"	A16	"
18	"	"	79MC (10MC Swp)	77.25MC 45.75MC	5	"	A17	Compress or expand coil turns until markers coincide as in Fig. 5.
19	"	"	69MC (10MC Swp)	67.25MC 45.75MC	4	"	A18	Adjust so that RF and IF markers coincide as in Fig. 5.
20	"	"	63MC (10MC Swp)	61.25MC 45.75MC	3	"	A19	Compress or expand coil turns until markers coincide as in Fig. 5.
21	"	"	57MC (10MC Swp)	55.25MC 45.75MC	2	"	A20	"

VHF TUNER RF ALIGNMENT FOR VHF/UHF CHASSIS ONLY

Care must be exercised not to disturb the preceeding aligned coil increments. Disconnect R20 from chassis ground and connect a 1KΩ resistor from loose end of R20 and connect other end of 1K (added) resistor to chassis.
Connect bias as under "VHF Tuner Oscillator Alignment For VHF And VHF/UHF Chassis". Loosen VHF tuner from chassis, stand tuner in a position to make adjustments. Connect a clip lead from VHF tuner to main chassis. If a separate marker generator is used couple it loosely to one side of antenna terminals.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211.25MC 215. 75MC	13	Vert. Amp. thru detector (Fig. 6) to junction of R20 and 1KΩ (added) resistor. Low side to chassis.	A21, A22, A23	Adjust A21 for maximum height. Adjust A22 for a flat-topped response. Adjust A23 for proper position of markers. See Fig. 7. Picture carrier should be 100%. Sound carrier may be low as 70%.
23	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A24, A25	Adjust for symmetrical response as in Fig. 7.
24	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check each channel for response similar to Fig. 7. If not within limits repeat steps 22 and 23. If necessary, make compromise adjustments of A21, A22, A23, A24 and A25 for best acceptable response.
			201MC (10MC Swp)	199.75MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
25	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A26, A27, A28	Adjust A26 for maximum mid-band height. Adjust A27 for flat-topped response. Adjust A28 for proper marker position as in Fig.7.
26	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A29, A30, A31	Compress or expand coil turns for response curve similar to Fig. 7.
27	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A32, A33, A34	"
28	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A35, A36, A37	"
29	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A38, A39, A40	"

30. Recheck all channels for flat-topped response. If necessary, retouch A21 thru A40 in order given. A dip of 30% is permissable on all channels. Remove 330Ω resistor from plate of V4 to B+. Restore connection to L50. Remove test equipment. Remove 1KΩ resistor from tuner and reconnect R20 to chassis.

USE VERY SHORT LEADS

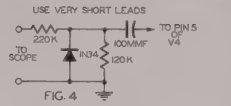


FIG. 4

ACCEPTABLE RESPONSE CURVES RF AND IF MARKERS COINCIDE

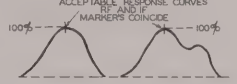


FIG.5

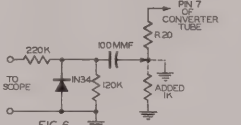
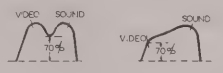


FIG.6

FIG.7



VHF TUNER RF ALIGNMENT FOR VHF CHASSIS ONLY

Care must be exercised not to disturb the preceeding aligned coil increments. Disconnect R30 from chassis ground and connect a 1KΩ resistor from loose end of R30 and connect other end of 1K (added) resistor to chassis.
Connect bias as under "VHF Tuner Oscillator Alignment for VHF and VHF/UHF Chassis". Loosen VHF tuner from chassis, stand tuner in a position to make adjustments. Connect a clip lead from VHF tuner to main chassis. If a separate marker generator is used couple it loosely to one side of antenna terminals.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
28	Two 130Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru detector (Fig. 6) to junction of R20 and 1KΩ added resistor. Low side to chassis.	A45, A46	Adjust A45 and A46 for response similar to Fig. 7. Adjust A45 for maximum height. Adjust A46 for correct marker position.
29	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check each channel for response similar to Fig. 7. If not within limits repeat step 28. If necessary make compromise adjustments of A45 and A46 for best acceptable response.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
30	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A47, A48	Adjust A47 and A48 for response similar to Fig. 7. Adjust A47 for maximum height. Adjust A48 for correct marker position as in Fig. 7.
31	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A49, A50	Compress or expand coil turns for response curve similar to Fig. 7.
32	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A51, A52	"
33	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A53, A54	"
34	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A55, A56	Compress or expand coil turns for response similar to Fig. 7. Recheck all channels. A dip of 30% is permissable on all channels. Remove 330Ω resistor from plate of V4 to B+. Restore connection to lug. Remove test equipment. Remove 1KΩ resistor from tuner and reconnect R20 to chassis.

UHF TUNER ALIGNMENT

Video bandpass should be checked before attempting UHF Alignment. Refer to step 7 and Fig. 2. Then switch VHF tuner switch to UHF position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

UHF TUNER OUTPUT CIRCUIT ALIGNMENT

Remove cover over mixer crystal (1N82A) located on top of UHF tuner. Remove 1N82A crystal. Solder one end of a 270Ω resistor to the L8 side of crystal holder. Connect high side of sweep generator to the other end of 270Ω. If sweep generator has no built-in marker, loosely couple a separate marker generator near sweep generator connection near the (added) 270Ω resistor. Connect bias as under "Video IF Alignment". Use only enough sweep generator output for useable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
35	270Ω Resistor	High side to loose end of 270Ω resistor. Other end of 270Ω to L8 side of crystal holder. Low side to chassis.	43.5MC (10MC Swp)	42.6MC 45.75MC	UHF tuning capacitor fully meshed)	Vert. Amp. thru 33KΩ to point A. Low side to chassis.	A41	Adjust for response curve similar to Fig. 2. Remove test equipment and 270Ω from crystal holder.

UHF OSCILLATOR ALIGNMENT

Adjust A43 by bending tab in or out.

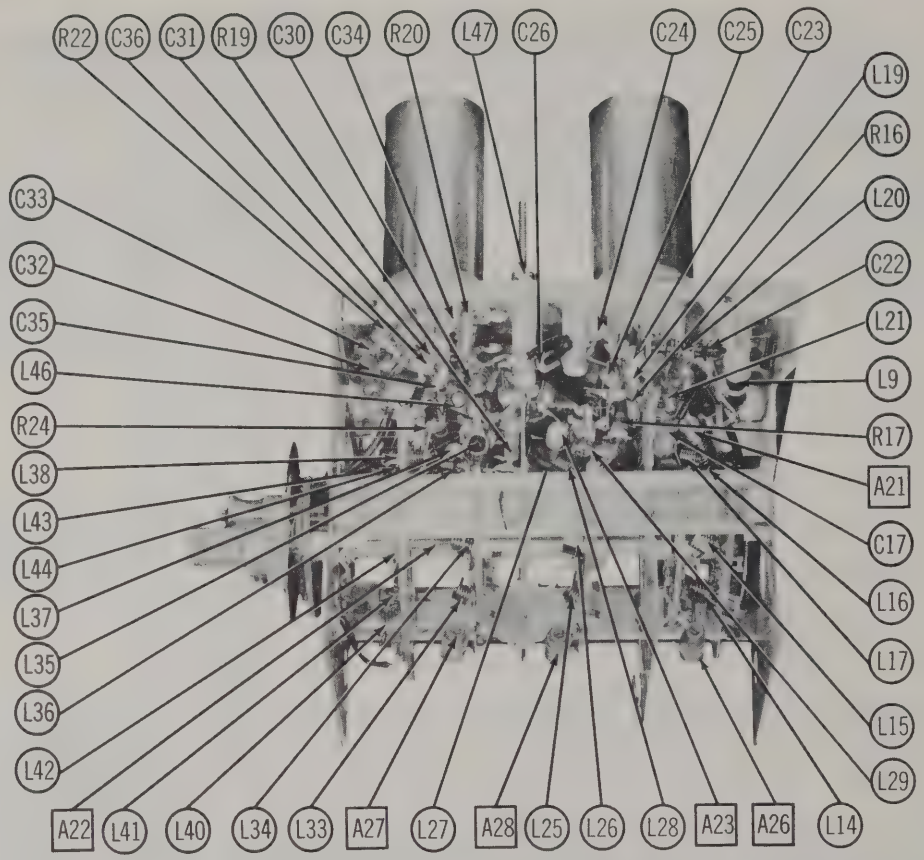
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
36	Two 130Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	460MC (Unmod)	14 (UHF tuning cap. fully meshed)	DC probe to point A. Low side to chassis.	A43	Adjust for maximum deflection.
37	"	"	900MC	83 (UHF tuning cap. fully meshed)	"	A43	Adjust for maximum deflection. Recheck step 36. Replace crystal and shield over crystal.

UHF PRESELECTOR ALIGNMENT

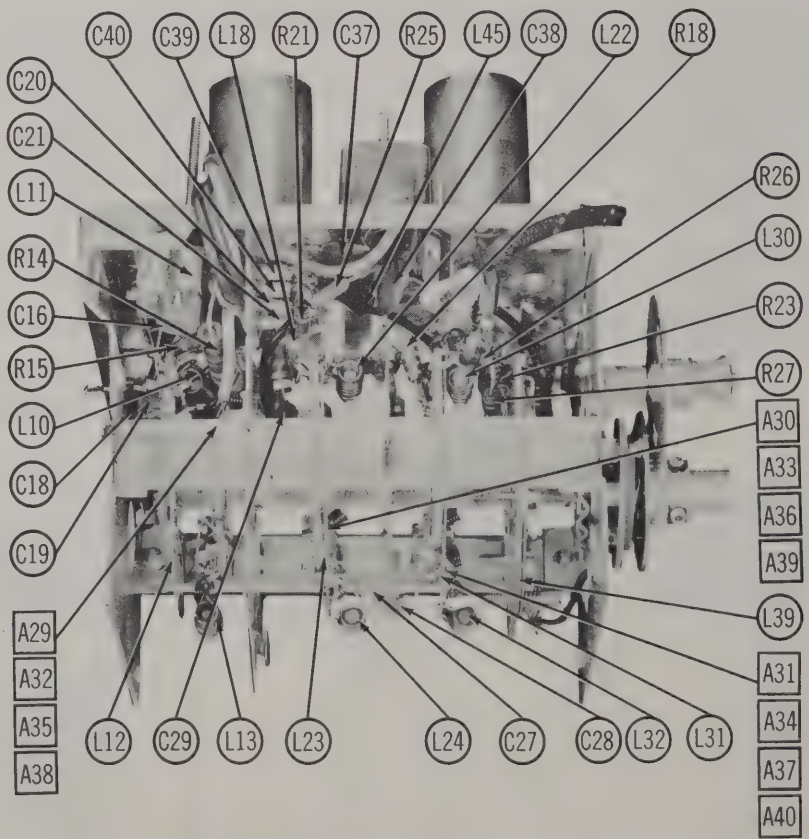
Connect bias as under "Video IF Alignment. Couple separate marker generator loosely to pin 1 (grid) of V4.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
38	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	900MC	42.6MC 45.75MC	UHF tuning capacitor fully open	Vert. Amp. thru 33KΩ to point A. Low side to chassis.	A44	Adjust by bending tab (A44) in or out from RF line for response similar to Fig.2, with markers in correct position.
39	"	"	460MC to 900MC	"	14 thru 83	"		Turn tuner and sweep generator simultaneously thru the entire UHF range and observe response curve which should be similar to Fig. 2. Adjust A44 for best compromise tilt and dip. If further adjustment is necessary, adjust by SLIGHTLY bending RF rotor plates. Make adjustment at point where rotor is just meshing with stator. Recheck entire range to insure adjustment for one frequency doesn't effect other too much. Do not readjust A6 or A7 to remove excessive dip or tilt.

SYLVANIA MODELS 21C402 Series, 21C402U Series, 21T10U Series, 21T10U Series, 617U Series, 614 Series, 614U Series, 622 Series, 622U Series (Ch. 1-326-1, -2, -3, -4, -5, -6)

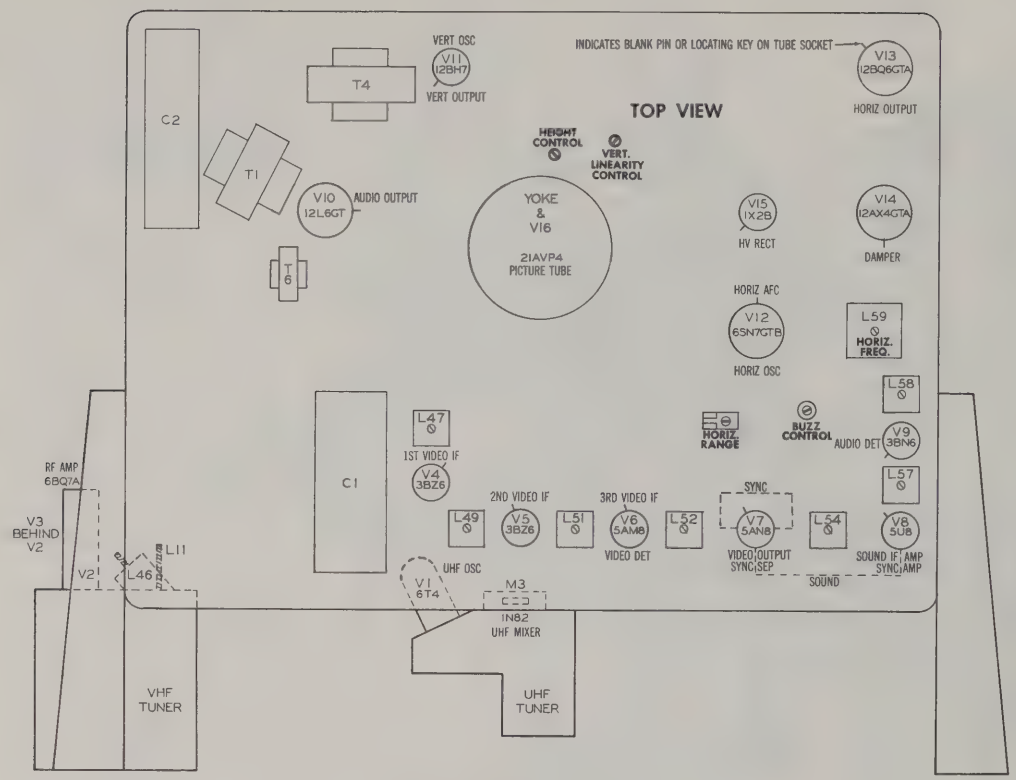


VHF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

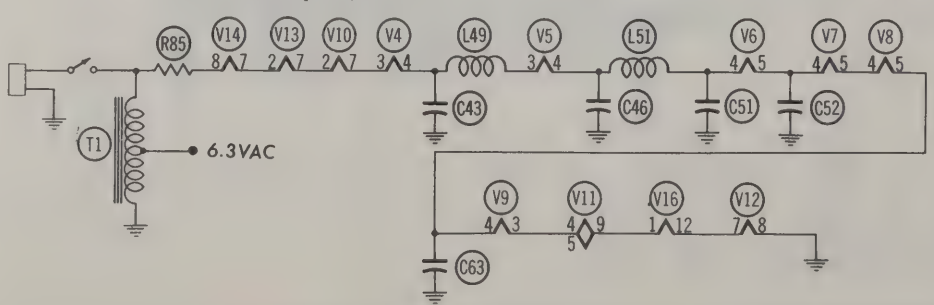
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V10 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V16
Has pic, no sound -V8, V9, V10

SYNC FAILURE
No vert. sync - V8, V11
No horiz. sync - V8, V12
No vert. or horiz. sync - V7, V8

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, M1, M2
Vert. off freq. - V8, V11
Horiz. off freq. - V8, V12



RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6T4	*■5. 5KΩ	8. 2KΩ	0Ω	. 1Ω	0Ω	8. 2KΩ	*■5. 5KΩ		
V 2	6BQ7A	■330Ω	1Meg	0Ω	0Ω	. 1Ω	■800Ω	1Meg	. 1Ω	0Ω
V 3	6X8	0Ω	27KΩ	■3. 3KΩ	0Ω	. 1Ω	0Ω	56KΩ	■100KΩ	■3. 3KΩ
V 4	3BZ6	1Meg	47Ω	10Ω	9Ω	■1. 8KΩ	■1. 8KΩ	0Ω		
V 5	3BZ6	1Meg	47Ω	9Ω	8Ω	■1. 8KΩ	■1. 8KΩ	0Ω		
V 6	5AM8	270Ω	. 1Ω	■1. 4KΩ	8Ω	7Ω	■680Ω	. 1Ω	3. 3KΩ	0Ω
V 7	5AN8	■390KΩ	2. 2Meg	0Ω	7Ω	6Ω	†5. 6KΩ	†33KΩ	1Meg	15Ω
V 8	5U8	■11. 5KΩ	1. 3Ω	■18KΩ	6Ω	5Ω	■18KΩ	150Ω	0Ω	22KΩ
V 9	3BN6	500Ω	3. 4Ω	5Ω	4Ω	■5. 6KΩ	5. 5Ω	†330KΩ		
V 10	12L6GT	TP	13Ω	†255Ω	†52Ω	280KΩ	NC	10Ω	120KΩ	
V 11	12BH7	▲1. 8KΩ	▰2. 5Meg	13KΩ	4Ω	4Ω	▰2. 5Meg	650KΩ	0Ω	3Ω
V 12	6SN7GTB	800KΩ	†120KΩ	300KΩ	250KΩ	†28KΩ	0Ω	1. 5Ω	0Ω	
V 13	12BQ6GTA	NC	15Ω	TP	†18KΩ	470KΩ	NC	13Ω	27Ω	TOP CAP ▰21Ω
V 14	12AX4GTA	TP	NC	550KΩ	TP	†175Ω	TP	15Ω	17Ω	
V 15	1X2B		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▰350Ω
V 16	21AVP4A	3Ω	820KΩ	PIN 6 †52Ω	PIN 10 ▰300KΩ	PIN 11 ■160KΩ	PIN 12 1. 5Ω			

*MEASURED IN "UHF" POSITION.
■MEASURED FROM 135 V LINE.
†MEASURED FROM OUTPUT OF M2.
▰MEASURED FROM PIN 3 of V14.
TP-TIE POINT.
NC-NO CONNECTION.

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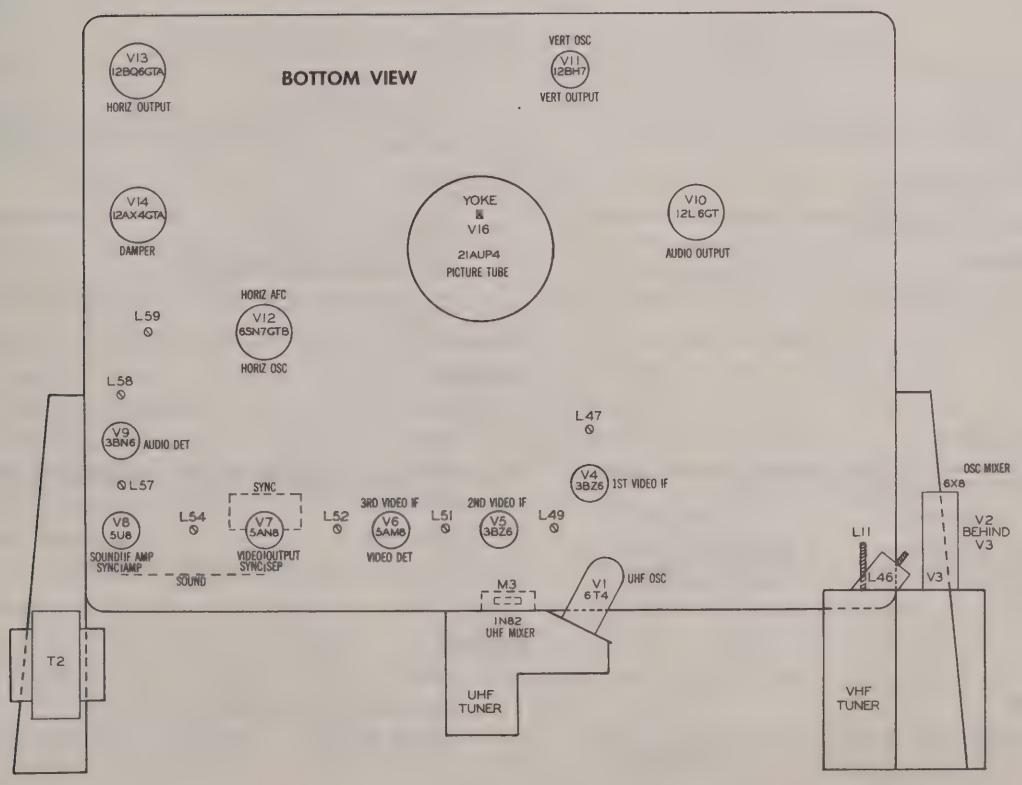


TUBE PLACEMENT CHART

SET 300 FOLDER 10

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check M1 and M2. Check R82, R84, C88, C89, T4, T6A and other associated components.

DRIVE LINES

Check by substitution V13 and V14. Check C88, C89, R82, T4, T6A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V13 and V14. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V12, V13 and V14. Check C84 and C85 for open. Check L59, R75, R76, R74, R3 and other associated components.

XMAS TREE EFFECT

Check by substitution V12, V13 and V14. Check T4 and T6 for internal arcing. Check L60, R71, R80, C82, C86, C87, C89 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V11. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T5, C4, C5, R70, R67, R66 and other associated components.	Check T3, C73, C78, C79, R69, R5 and other associated components.

INSUFFICIENT SWEEP

Substitute V11. Check height and vertical linearity controls for proper operation.

COMPRESSED AT BOTTOM

Substitute V11. Check R69, R5, T3, C78, C4 and other associated components.

COMPRESSED AT TOP

Substitute V11. Check C2D, C80, R66, R67, R6, T5 and other associated components.

FOLDS

Substitute V11. Check C74, C75, C78, T3, T5, T6B and other associated components.

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V7 and V8. Check C69, C70, R57, R60, R61 and other associated components.

SYNC

LOSS OF VERTICAL SYNC- HORIZONTAL SYNC SATISFACTORY

Substitute V11. Check T3, R4, R62, C72, C71, and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V12. Check C81, C84, C85, R74, R3 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V8 and V12. Check components associated with V12.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C56, C57, C2C, R44, R45 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A8. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check contrast control. Check L55, L56, L57, C56, C57 and other associated components.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check C56, C57, L56, and other associated components.

SMEAR

Substitute V7. Check L55, L56, L57, R45, C56, C57 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, and V10. Check stage V10 using audio signal generator. Apply audio signal across C64.

If Satisfactory	If Unsatisfactory
Check audio detector and audio IF stages for component failure or change of value.	Check C64, C65, C66, C67, C68, R55, R54, T7 speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments A11 and R7 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound".

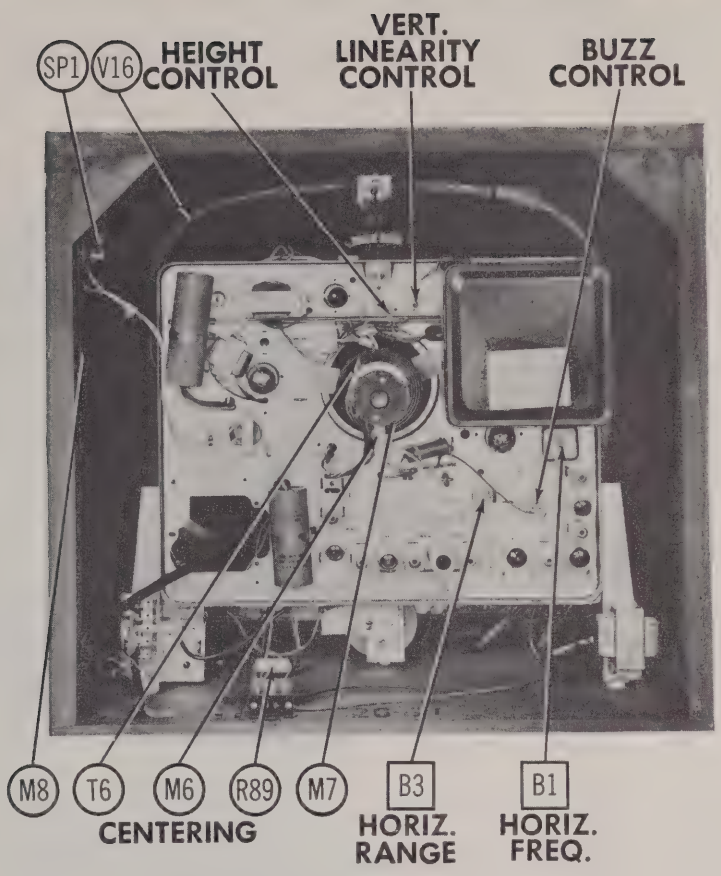
POWER

DEAD SET

If filaments fail to light, check all tubes. These tubes are connected in series. Check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M1, M2, C1 and R89. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check M1, M2, R89 and C1. Check B+ filter and decoupling network.



PROPERTY OF
L. F. [illegible]
3924 MEADE ST.
DENVER, COLORADO

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Adjust the contrast and brightness controls for a normal picture.

① Preset the horizontal range trimmer (B3) one half turn from maximum clockwise position.

② Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

③ Connect the vertical amplifier of the oscilloscope through a low capacity probe Fig. 8 to terminal "C" of L60. Low side to chassis. Adjust the horizontal waveform slug (B2) until waveform similar to Fig. 9 is obtained. While making this adjustment keep the picture in sync with the horizontal hold and if necessary, B1. Remove scope from terminal "C" of L60.

④ Connect the vertical amplifier of the oscilloscope thru a low capacity probe Fig. 8 to the ungrounded side of B3. Connect the low side of oscilloscope to chassis. Calibrate scope with low capacity probe. Adjust B3 for 25 volts peak to peak on oscilloscope. Keep the picture in sync with the horizontal hold control and B1. Remove scope connection from B3.

⑤ Turn the horizontal hold control fully counter clockwise. Turn B1 until two diagonal lines are sloping to the right.

⑥ Turn the horizontal hold control fully clockwise. Then turn the horizontal hold control slowly counter clockwise and observe the number of diagonal bars just before picture locks in sync. If more than three diagonal bars are present, just before picture falls in sync, repeat steps 3, 4 and 5.

⑦ In weak signal areas the horizontal hold control should be adjusted so that when switching on and off channel the picture returns completely in sync.

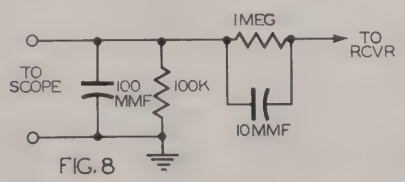


FIG. 8

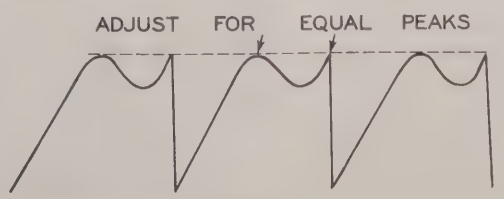
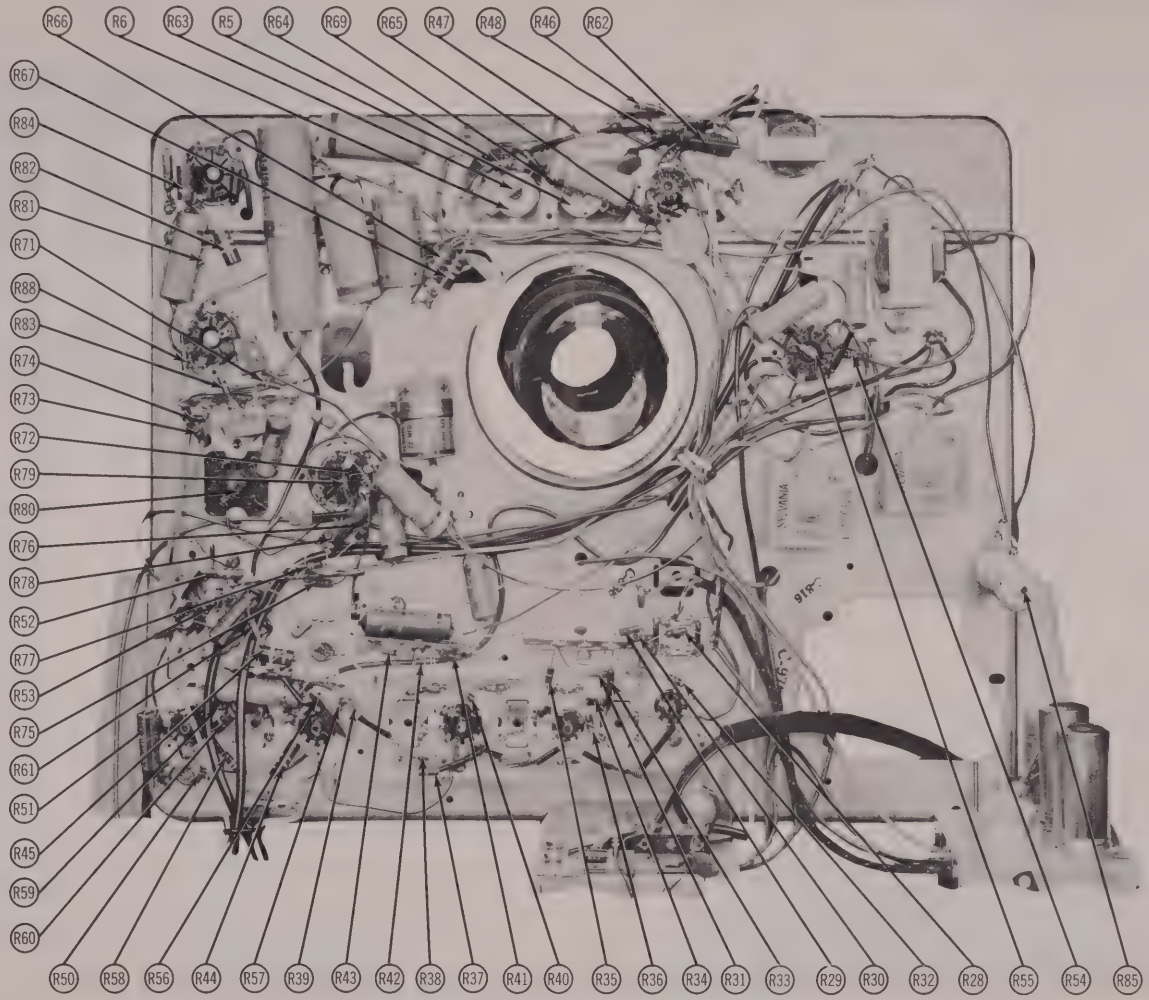


FIG. 9

SYLVANIA MODELS 21C402 Series, 21C402U Series, 21T103 Series, 21T103U Series, 612 Series, 612U Series, 614 Series, 614U Series, 622 Series, 622U Series (Ch. 1-526-1, -2, -3, -4, -5, -6)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	UHF Osc.	6T4	6T4	7DK	
V2	RF Amp.	6BQ7A	6BQ7A	9AJ	
V3	Mixer-Osc.	6X8	6X8	9AK	
V4	1st Video IF Amp.	3BZ6	3BZ6	7CM	
V5	2nd Video IF Amp.	3BZ6	3BZ6	7CM	
V6	3rd Video IF Amp. - Video Det.	5AM8	5AM8	9CY	
V7	Video Output- Sync Sep.	5AN8	5AN8	9DA	
V8	Sound IF Amp. - Sync Amp.	5U8	5U8	9AE	
V9	Audio Det.	3BN6	3BN6	7DF	
V10	Audio Output	12L6GT	12L6GT	7AC	
V11	Vert. Osc. - Vert. Output	12BH7	12BH7	9A	
V12	Horiz. AFC- Horiz. Mult.	6SN7GTB	6SN7GTB	8BD	
V13	Horiz. Output	12BQ6GTA	12BQ6GTA	6AM	
V14	Damper	12AX4GTA	12AX4GTA	4CG	
V15	HV Rect.	1X2B	1X2B	9Y	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	SYLVANIA PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V16	21AVP4A ②	21AVP4A ①		21AVP4A②	21AVP4A ②	12L	① Aluminized
				21AVP4	21AVP4	12L	② Silver Screen
	21YP4A ②	21YP4A ①	21YP4A ①	21YP4A ②	21YP4A ①	12L	
		21YP4	21YP4	21YP4	21YP4	12L	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	SYLVANIA PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1	140	300	161-1018	WS427	TD-150-300	S-200	
C2A	140	300	161-4016	WQ505	CDB-1008	Q-162	
B	200	150					
C	5	300					
D	30	150					
C3A	200	150	161-2013	WD345	TDL-205	D-088	
B	5	150					
C4	10	400	161-1013	TC72	TD-10-450	FM-4510	
C5	20	450	161-1017	TC75	TD-20-450	FM-4520	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	SYLVANIA PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C6	470	2000	174-04702	DD30-471	3KV-471	DC30347	
C7	470	2000	174-04702	DD30-471	3KV-471	DC30347	
C8	2-5.5						
C9	800			DD-801	831-801	DC-521	
C10	800			DD-801	831-801	DC-521	
C11	800						
C12	800						
C13	33			TCN-33	N750K-330		
C14	470	2000	174-04702	DD30-471	3KV-471	DC30347	
C15	470	2000	174-04702	DD30-471	3KV-471	DC30347	
C16	10			D6-100	GP1K-100	UC-541	
C17	22			D6-220	GP1K-220	UC-542	
C18	5			TCZ-5	NPOA-050	ZT-555	
C19	220			D6-221	GP2K-221	UC-5322	
C20	800						
C21	800						
C22	150			DD-151	811-151	UC-5315	
C23	5			TCZ-5	NPOA-050	ZT-555	
C24	800			DD-801	831-801	DC-521	
C25	800			DD-801	831-801	DC-521	
C26	.33						
C27	3.9						
C28	1.2						
C29	150			DD-151	811-151	UC-5315	
C30	33			D6-330	GP1K-330	UC-5433	
C31	1.8						
C32	18						
C33	8						
C34	800			DD-801	831-801	DC-521	
C35	470						
C36	5			TCZ-5	NPOA-050	ZT-555	
C37	130						
C38	1000			DD-102	801-001	DC-521	
C39	800						
C40	800						
C41	1000		166-1000D	DD-102	801-001	DC-521	
C42	1000		166-1000D	DD-102	801-001	DC-521	
C43	1000		166-1000D	DD-102	801-001	DC-521	
C44	1000		166-1000D	DD-102	801-001	DC-521	
C45	1000		166-1000D	DD-102	801-001	DC-521	
C46	1000		166-1000D	DD-102	801-001	DC-521	
C47	1000		166-1000D	DD-102	801-001	DC-521	
C48	1000		166-1000D	DD-102	801-001	DC-521	
C49	1000		166-1000D	DD-102	801-001	DC-521	
C50	1000		166-1000D	DD-102	801-001	DC-521	
C51	1000		166-1000D	DD-102	801-001	DC-521	
C52	1000		166-1000D	DD-102	801-001	DC-521	
C53	4700		166-4700D	DD-472	811-0047	DC-525	
C54	10		166-0010P	TCZ-10	NPOK-100	ZT-541	
C55	.22	100	160-06022			PT4022	

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	181E PART No.	MALLORY PART No.	NOTES
C56	.1	200	160-0061	DF-104		PT401	
C57	.1	600	160-0061	DF-104		PT401	
C58	4700		168-4700D	DD-472	811-0047	DC-525	
C59	.01	600	160-0611	DH-103	GP2-333-103	PT611	
C60	4700		168-4700D	DD-472	811-0047	DC-525	
C61	4700		168-4700D	DD-472	811-0047	DC-525	
C62	.01	600	160-0611	DH-103	GP2-333-103	PT611	
C63	4700		168-4700D	DD-472	811-0047	DC-525	
C64	1000		168-1000D	DD-102	801-300	DC-521	
C65	4700		168-4700D	DD-472	811-0047	DC-525	
C66	.022	400	160-0622	DF-203	817-02	PT4122	
C67	.022	600	160-0622	DF-203	817-02	PT6122	
C68	1000		168-1000D	DD-102	801-001	DC-521	
C69A	270				811-271	UC-5327	
B	1000Ø		†180-0018	†PC-360	811-01	DC-521	
C	25				GPSK-250	UC-5425	
C70	.047	600	160-0647	DF-503		PT6147	
C71A	4700		‡180-0018	‡PC-306	811-0047	DC-525	
B	4700				811-0047	DC-525	
C72	.01	600	160-0611	DH-103	GP2-333-103	PT611	
C73	4700		168-4700D	DD-472	811-0047	DC-525	
C74	.047	600	160-0647	DF-503		PT6147	
C75	.033	100	160-0633	DF-333		PT6133	
C76	.01	600	160-0611	DH-103	GP2-333-103	PT611	
C77	470	500	183-0470	DH-471	GPSK-471	MC345	Note 1
C78	300	500	183-0300	DH-301	GPSK-301	MC335	
C79	330	4000	174-0330	DH60-33	SKV-331	DC60333	
C80	4700		168-4700D	DD-472	811-0047	DC-525	
C81	33		168-0330	D6-330	GPSK-330	UC-5433	
C82	33		168-0033P				
C83	.047	600	160-0647	DF-503		PT6147	
C84	.033	200	160-0633	DF-303	817-03	PT4133	
C85	.22	100	160-0622			PT4122	
C86	330	500	183-0330	D6-331	811-331	MC3240	
C87	.01	400	160-0611	D6-103	GP2-333-103	PT411	
C88	1500	500	183-1500				
C89	560	500	183-0560	D6-561	811-561		Note 2
C90	.047	600	160-0647	DF-503		PT6147	
C91	.22	600	160-0622			PT6122	
C92	.33	600	160-0633			PT6222	
C93	.1	600	160-0611	DF-104		PT601	
C94	47	3000		DD30-470	3KV-470	DC30447	
C95	.047	600	160-0647	DF-503		PT6147	
C96	.1	200	160-0611	DF-104		PT401	Note 1
C97	56	3000	174-0056	DD30-560	3KV-560	DC30456	Note 1
C98	56	3000	174-0056	DD30-560	3KV-560	DC30456	Note 1

Note 1 Not used in some versions.
Note 2. Some versions use .01MFD in this application (Part No. 160-0611).
† Items C89A, C89B, C89C, R56A, R56B and R56C are combined in one unit.
‡ Items C71A, C71B, R62A and R62B are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5Meg	½	152-0059	Q11-141	A47-5Meg-S	AB-87	SU-67	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A.
R2A	1500Ω	½	157-0095	Q7-795 ▲	RTV-315	F1-7	UF153R	Contrast (Panel)
B	3300Ω					R3-41	UR154A ▲	Volume (Rear) Attach to R2A)
C	Switch					KS-1	US-98	Attach to R2B.
R3A	145KΩ	½	153-0081	Q11-125 ▲	A47-15K-S	AB-35 ▲	TA15L ▲	Horizontal Hold (Stop at 70KΩ)
B	Shaft		Not Req.	Not Req.	FS-3	AK-3		Attach to R3A.
R4A	1Meg	½	153-0063	Q11-1341	A47-750K-S	AB-86 ▲		Vertical Hold (Stop at 650KΩ)
B	Shaft		Not Req.	Not Req.	FS-3	AK-3		Attach to R4A.
R5A	5Meg	½	153-0058	Q11-142 ▲	A47-4Meg-S	AB-86 ▲	TA56L ▲	Height (Stop at 4Meg)
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A.
R6A	750Ω	½	153-0060	Q11-105	A47-750-S	AB-5	TA75L	Vertical Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A.
R7	1000	2	159-0003		39-1000			Buss (Wire Wound)

▲ Connect a 75KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
† Connect a 350KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
• Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
▲ Universal replacement (Mallory exact duplicate part No. UR187G).
▲ CONCENTRIKIT EQUIVALENT; K-5 KIT, BASE ELEMENTS AND SHAFTS; B17-109, P1-026 (Panel) B13-132, R14-116 (Rear) 7-61, Switch

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R3	470KΩ	½	181-0474	BTS-470K	
R4	470KΩ	½	181-0474	BTS-470K	
R10	8200Ω	½			
R11	220KΩ	½		BTA-220K	Note 1
R12	470KΩ	½	181-0474	BTS-470K	
R13	470KΩ	½	181-0474	BTS-470K	
R14	330KΩ	½		BTA-330K	
R15	22KΩ	½			
R16	100Ω	½		BTS-100	
R17	47Ω	½		BTS-470	
R18	3300Ω	½			
R19	330Ω	½		BTS-330	
R20	56KΩ	½			
R21	33Ω	½			
R22	27KΩ	½			
R23	82Ω	½		BTS-820	
R24	680Ω	½		BTS-6800	
R25	3300Ω	½		BTS-3300	
R26	100KΩ	½		BTS-100K	Note 2
R27	33Ω	½		BTS-330	
R28	100Ω	½	181-0103	BTS-1000	
R29	100Ω	½	181-0103	BTS-1000	
R30	10KΩ	½	181-0103		
R31	180Ω	½	181-0183	BTS-1800	
R32	470.5%	½	181-04705	BTS-47 5%	
R33	1000Ω	½	181-0103	BTS-1000	
R34	10KΩ	½	181-0103		
R35	180Ω	½	181-0183	BTS-1800	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R36	470.5%	½	181-04705	BTS-47 5%	
R37	680Ω	½	181-0681	BTS-680	
R38	18KΩ	½	181-0183		
R39	680Ω	½	181-0681	BTS-680	
R40	270Ω	½	181-0271	BTS-270	
R41	1Meg	½	181-0105		
R42	3300Ω	½	181-0332		
R43	1Meg	½	181-0105		
R44	33KΩ	1	185-0333	BTA-33K	
R45	5600Ω	2	183-0563	BTS-5600	
R46	820KΩ	½	181-0824		
R47	390KΩ	½	181-0394		
R48	820KΩ	½	181-0824		
R49	100KΩ	½	181-0104		
R50	18KΩ	½	181-0183	BTS-185	
R51	150Ω	½	181-0151	BTS-150	
R52	5600Ω	½	181-0563	BTA-5600	
R53	470Ω	½	181-0471	BTS-470	
R54	560KΩ	½	181-0564	BTS-560K	
R55	470KΩ	½	181-0474	BTS-470K	
R56A	10KΩ				
B	330KΩ	½		†180-0018	
C	2.2MEG				
R57	390KΩ	½	181-0394		
R58	120KΩ	½	181-0134		
R59	22KΩ	½	181-0223		
R60	6800Ω	½	183-0683		
R61	4700Ω	½	181-0472		

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R62A	22KΩ	½	*180-0019		
B	10KΩ				
R63	5600Ω	½	181-0562		
R64	47KΩ	½	181-0473		
R65	820KΩ	½	181-0822		
R66	27KΩ	2	183-0273		
R67	22KΩ	2	183-0223		
R68	120Ω	½	181-0121		
R69	56KΩ	½	181-0563		
R70	100ΩΩ	½	182-0102		
R71	150KΩ	½	181-0154		
R72	560KΩ	½	181-0564		
R73	27KΩ	½	181-0273		
*74	100KΩ	½	181-0104		
.5	9300Ω		181-0832		

† Items C89A, C89B, C89C, R56A, R56B, R56C are combined in one unit.
* Items C71A, C71B, R62A, R62B are combined in one unit.
Note 1. Some versions use a 510ΩΩ ½W resistor in this application. (Mfgr. Part #181-0513).
Note 2. Some versions use a 10K ½W resistor in this application.((Mfgr. Part #181-0103).
Note 3 Some versions use a 12KΩ 2W resistor in this application. (Mfgr Part #183-0123).
Note 4. Some versions use a 47Ω ½W or a 33Ω ½W or a 33Ω ½W resistor in this application.
Note 5. Used in chassis 1-526-1, -4, -5 only.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R76	150KΩ	½	181-0154		
R77	150KΩ	½	181-0154		
R78	100KΩ	½	181-0104		
R79	2.7Meg	½	181-0275		
R80	18KΩ	½	181-0183		
R81	470KΩ	½	181-0474		
R82	18KΩ	2	183-0183		Note 3
R83	33Ω	½		BW½-27	Note 4
R84	120Ω	2	183-0121		
R85	58.41Ω 1%	25	187-0033		Note 5
R86	100KΩ	2	189-0049	BTB-100K	
R87	100KΩ	2	189-0049	BTB-100K	
R88	100Ω	½	181-0103	BTS-1000	
R89	7.5Ω	5	187-0038		
R90	470KΩ	½	181-0474	BTS-470K	

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	RCA TYPE No	Stancor PART No.	Thordarson PART No	Triad PART No
T1	117VAC @ 1A Tap @ 6.3VAC 1.4A			141-0063	F-561 ① ②	P-2944 ①		P-6134 ① ½	21F08 ①	F-14X ① ½

① Taps 6.3VCT
② Drill one new mounting hole.

TRANSFORMER (HALOLIGHT)

ITEM No.	RATING PRI	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117VAC @ 1.4A	1140VAC		141-0030		P-3065 ①			32R43 ①	

① Drill one new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	Vert. Osc. Trans.	242-0003	B6702	A-3006		V405	A-8125	26A03	A-97X
T4	Horiz. Output Trans.	241-0033 ①	FB41L* ③	HVO-9P ③	230T1* ③	X060* ④	A-8265* ③	FLY-24* ③	D-19* ③
		241-0025 ②	FB41M* ③	HVO-9P ③	230T1* ③	X080* ③	A-8280* ③	FLY-24* ③	D-18* ③
T5	Vert. Output Trans.	241-0024	Z1900 ③	A-3081 ③		V306 ③	A-8140 ③	26S55 ③ ⑤	A-103X ③
T6A	Yoke-Horiz. (25MH)	100-0022 ⑤	DF803 ③	MDF-74	214D1 ③	Y7CF25/5	DY-10A ③	Y-11 ③	Y-20-1 ③
B	Vert. (3.3MH)		⑤	⑤	⑤	⑤	⑤	⑤	⑤

① Order Sylvania service part No. 241-0033, when production No. 50-61528-2, -3, -4, -5, -6; 50-84586-1; or 50-84581-1 is stamped on unit.
② Order Sylvania service part No. 241-0025 only when production No. 50-61528-1 is stamped on unit.
③ Connect an auto transformer.
④ Drill new mounting holes.
⑤ Use 50 to 1 turns ratio.
⑥ Includes capacitor C94.
⑦ Use original rear cover and centering device.
⑧ Connect horizontal damping network across terminals #1 & #2. Use original if necessary.
⑨ Connect terminals #5 & #8 of vertical yoke as in original circuit.
⑩ Remove 270MMF capacitor from terminals #1 & #8.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTION)	Hallodorson Part No. Replacement Connections	Merit Part No. Replacement Connections	RCA Part No. Replacement Connections	Ram Part No. Replacement Connections	Stancor Part No. Replacement Connections	Thordarson Part No. Replacement Connections	Triad Part No. Replacement Connections
	4	H. V.	H. V.	H. V.	H. V.	H. V.	H. V.	H. V
	3	9	8	9	9	9	9	9
	2	8	6	8	7 & 8	8	8	7 & 8
	1	3 or 1	3 or 1	3 or 1	3 or 1	3 or 1	3 or 1	3 or 1
Special Keon **		⑪	⑪	⑪	⑪	⑪	⑪	⑪

⑪ If insufficient width, add capacity (approx. 56 to 100MMF ④ 3KV) across horiz. yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T7	2KΩ	3.4Ω	143-0041	Z1101	A-3025	A-3333	26S58 ①	S-12X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA SYLVANIA PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.4Ω	539-0403 ①	4A07	① Used in models 612, 614, and 21T103 series.
	8"	PM	3.4Ω	539-0804 ②	8A21	② Used in models 622 and 21C402 series.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	Fil. Choke	0Ω						
L4	Fil. Choke	0Ω						
L5	Cathode Choke	0Ω						
L6	UHF Mixer Coupling Coil	0Ω						
L7	UHF Osc Coupling Coil	0Ω						
L8	UHF IF Output Coil	.2ΩCT						
L9	VHF Ant. Trans.	.2ΩCT	.1Ω					Channel 13
L10	VHF Ant. Coil	0Ω						
L11	VHF IF Coil	0Ω						
L12	VHF Ant. Coils	0Ω						Channels 7 thru 12
L13	VHF Ant. Coil	0Ω						Channel 6
L14	VHF Ant. Coil	0Ω						Channel 5
L15	VHF Ant. Coil	0Ω						Channel 4
L16	VHF Ant. Coil	0Ω						Channel 3
L17	VHF Ant. Coil	0Ω						Channel 2
L18	Fil. Choke	0Ω						
L19	Cathode Choke	.1Ω						
L20	Neut. Coil	0Ω						
L21	RF Coil	.1Ω						
L22	VHF RF Coil	0Ω						Channel 13
L23	VHF RF Coils	0Ω						Channels 7 thru 12
L24	VHF RF Coil	0Ω						Channel 6
L25	VHF RF Coil	0Ω						Channel 5
L26	VHF RF Coil	0Ω						Channel 4
L27	VHF RF Coil	0Ω						Channel 3
L28	VHF RF Coil	0Ω						Channel 2
L29	UHF IF Coil	0Ω						
L30	VHF Mixer Coil	0Ω						Channel 13
L31	VHF Mixer Coils	0Ω						Channels 7 thru 12
L32	VHF Mixer Coil	0Ω						Channel 6
L33	VHF Mixer Coil	0Ω						Channel 5
L34	VHF Mixer Coil	0Ω						Channel 4
L35	VHF Mixer Coil	0Ω						Channel 3
L36	VHF Mixer Coil	0Ω						Channel 2
L37	UHF IF Coil	0Ω						
L38	VHF Osc. Coil	0Ω						Channel 13
L39	VHF Osc. Coils	0Ω						Channels 7 thru 12
L40	VHF Osc. Coils	0Ω						Channel 6
L41	VHF Osc. Coil	0Ω						Channel 5
L42	VHF Osc. Coil	0Ω						Channel 4
L43	VHF Osc. Coil	0Ω						Channel 3
L44	VHF Osc. Coil	0Ω						Channel 2
L45	Fil. Choke	0Ω						
L46	RF Coil	0Ω						
L47	Conv. Plate	0Ω						
L48	1st. Video IF	.1Ω		115-0007	17-5003 *	TV-128 *	6333 *	Includes 47.25MC trap
L49	Fil. Choke	0Ω		147-0014	19-3001	TV-128	6604	.7 Microhenry
L50	2nd. Video IF	.1Ω	.1Ω	115-0003	17-5003	TV-127	6333	Includes 41.25MC trap
L51	Fil. Choke	0Ω		147-0014	19-3001	TV-129	6604	.7 Microhenry
L52	3rd. Video IF	.1Ω	.1Ω	115-0006	17-5004	TV-125 ■	6333 ■	
L53	4th. Video IF	.1Ω	.1Ω	115-0004	17-5004	TV-125	6334	
L54	Series Peaking Coil	1.4Ω		115-0030	19-1001		6604	1.5 Microhenries
L55▲	4.5MC Trap	5.5Ω						
B	1st. Sound IF	1.3Ω		120-0009				
L56	Shunt Peaking Coil	20Ω		131-2021	19-3660 ▲		6148 ▲	710 Microhenries, wound on 4.7KΩ resistor
L57	Series Peaking Coil	12Ω		131-2020	19-4201 •	TV-125 •	6154 •	230 Microhenries, wound on 27KΩ resistor
L58	2nd. Sound IF	1.8Ω	3.4Ω	120-0008	17-3489		6303	
L59	Quadrature Coil	5.5Ω		124-0002	17-1038		1481	
L60	Horiz. Osc.	29Ω	62Ω	242-0004	20-1403 ▲	TV-123 ▲	6283 ▲	Waveform winding-48Ω
L61	RF Coil	1.9Ω		115-0010	19-1005		6812	9.6 Microhenries
L62	RF Coil	1.9Ω		115-0010	19-1005		6812	9.6 Microhenries
L63	RF Coil	1.9Ω		115-0010	19-1005		6812	9.6 Microhenries

* Use one winding.
■ Retune trap winding.
▲ Parallel with 4.7KΩ resistor.
• Parallel with 27KΩ resistor.
▲ Reverse coil mounting in can.

FILTER CHOKE

ITEM No	RATINGS TOTAL DIRECT CURRENT	RATINGS D C RESISTANCE	RATINGS INDUCTANCE (@ CURRENT 1000 ^A)	REPLACEMENT DATA SYLVANIA PART No	Hallodorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
L64	210ADC	52Ω	1.37BY	145-0016	C5040	C-2994	C-2327	28C41	C-21X ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No	RATING CURRENT	REPLACEMENT DATA SYLVANIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.210ADC	517-0009	1028A	RS250	68250	6Q3	300	
M2	210ADC	517-0009	1028A	RS360	68250	6Q3	300	

SYLVANIA MODELS 21C402 Series, 21C402U Series, 21T103 Series, 21T103U Series, 612 Series, 612U Series, 614 Series, 614U Series, 622 Series, 622U Series (Ch. 1-526-1, -2, -3, -4, -5, -6)

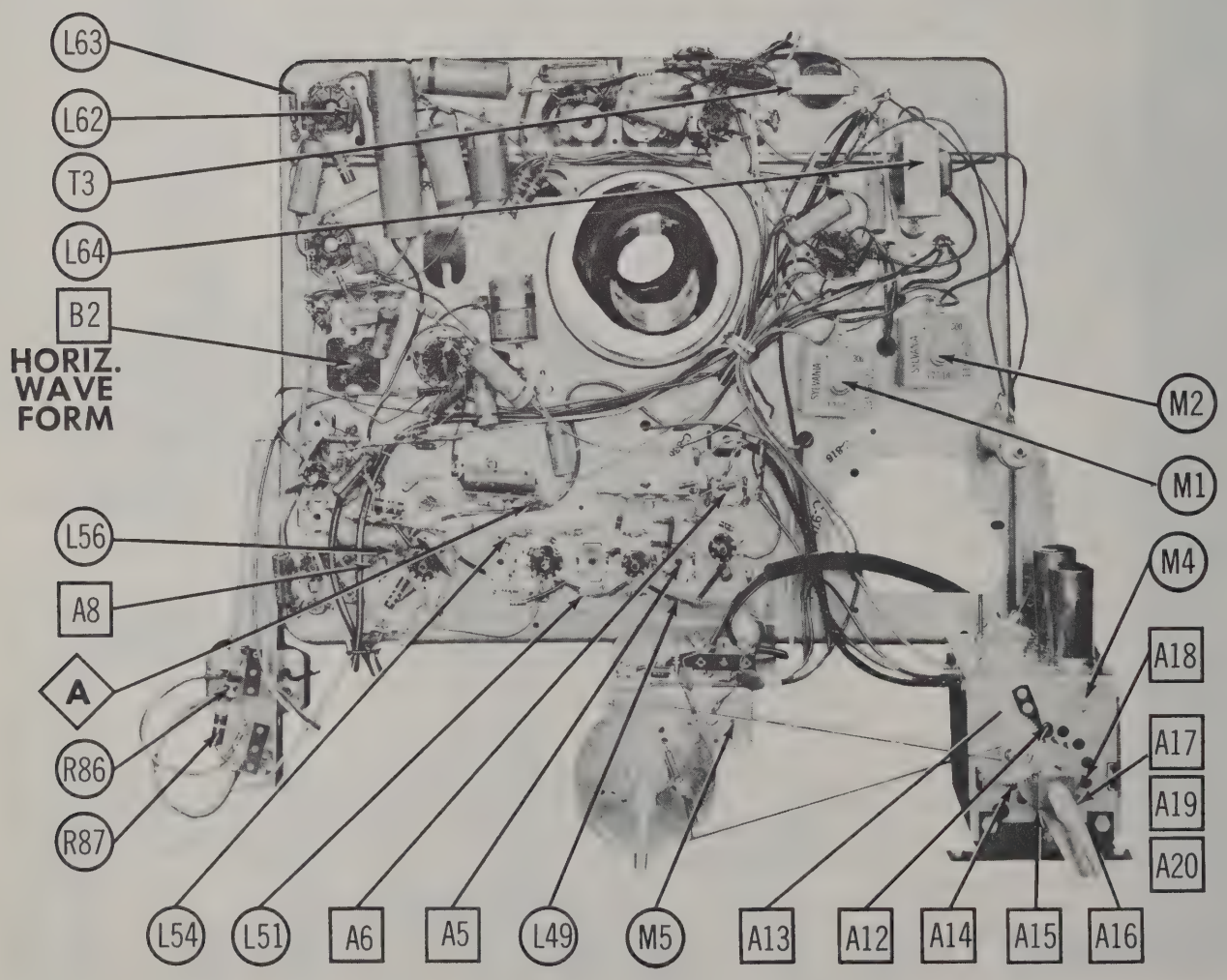
PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

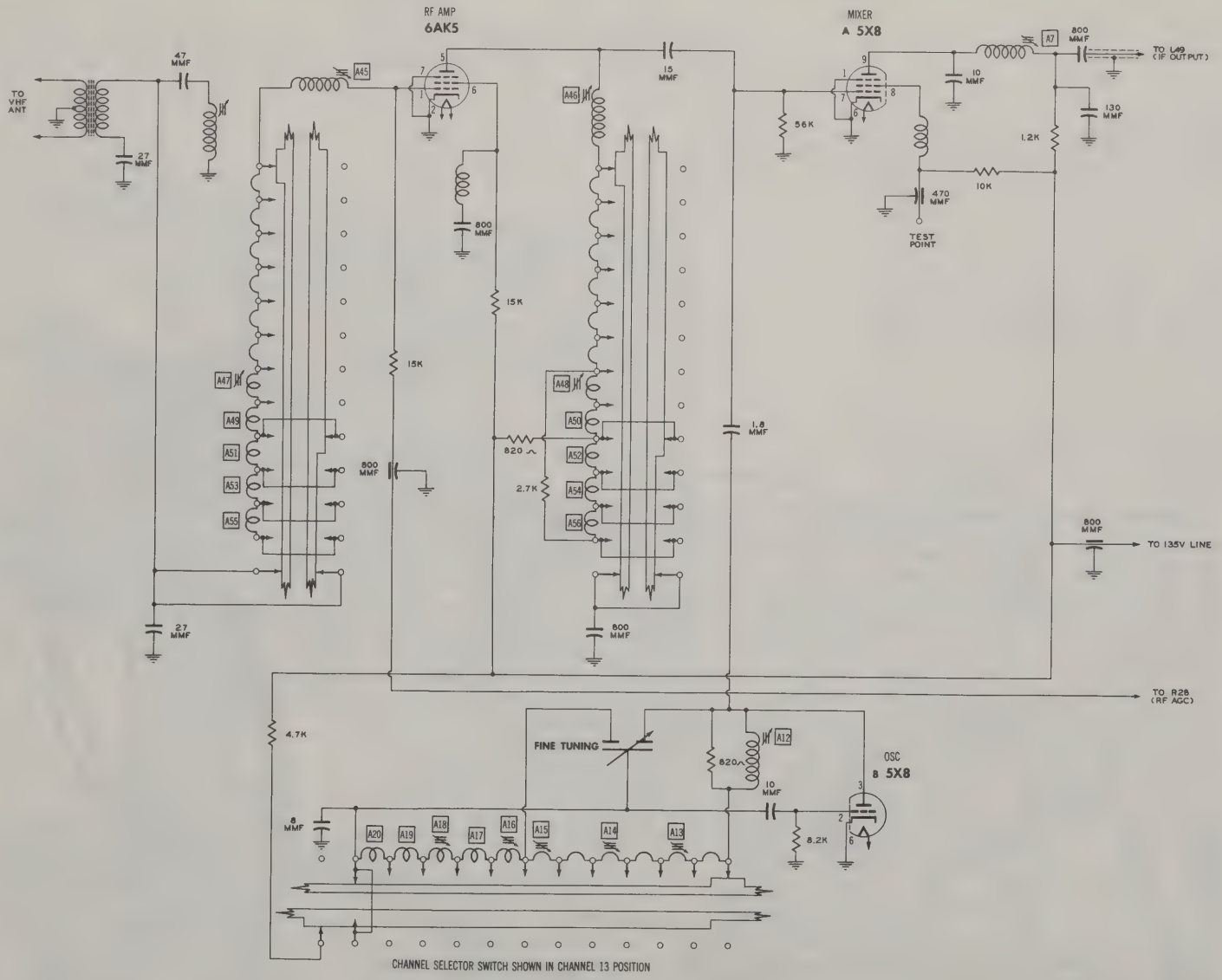
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		SYLVANIA PART No.	SYLVANIA PART No.	
M3	1N82A		1N82A	UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M4	Tuner	323-0056	VHF - Models 612MU Series, 614U Series and 622U Series
	Tuner	323-0058	VHF - Models 612 Series , 614 Series, 622 Series
M5	Tuner	323-0057	UHF - Models 612MU Series, 614U Series, 622U Series
M6	Centering Device		Part of deflection yoke-rear cover (T5)
M7	Ion Trap	400-0022	
M8	Tube	611-2102	HaloLight - Used with 21YP4A picture tube
	Tube	611-2103	HaloLight - Used with 21AVP4A picture tube
B3	Trimmer Cap.	172-0038	Horiz. Range (10-160MMF)
	Knob	740-0078	Brightness
	Knob	740-0076	Contrast
	Knob	740-0075	Fine tuning
	Knob	740-0074	Horiz. & vert. Hold
	Knob	743-0031	On-off-volume
	Knob	740-0079	UHF channel indicator - Models 612MU Series, 614U Series, and 622U Series
	Knob	743-0032	VHF channel selector - Models 612 Series, 614 Series and 622 Series
	Knob	743-0036	VHF channel selector - Models 612MU Series, 614U Series and 622U Series
	Safety Glass	710-0016	Models 612 Series and 622 Series
	Safety Glass	710-0009	Model 614 Series
	Mask	716-0023	Models 612 Series and 622 Series
	Mask	716-0008	Model 614 Series



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION



VHF TUNER PART NO. 323-0058 USED WITH VHF MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF TUNER SCHEMATIC

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V12, V13, V14 and V15. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check T4, T6A, C90, C91, C92, C93 R82, R84 and other associated components.	Check L60, C83, C86, C87, C88, C89, R73, R74, R80 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13, V14, and V15. Check M1 and M2. Check R82, R84, C1, C89, T4, T6A and other associated components.

BLOOMING

Check by substitution V13, V14 and V15. Check M1 and M2. Check C88, C89, C1, R82, R89, T4, T6A and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or no Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7 and V10. Check video IF components for failure or change of value. Raster, No Sound, No Picture, UHF, substitute V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

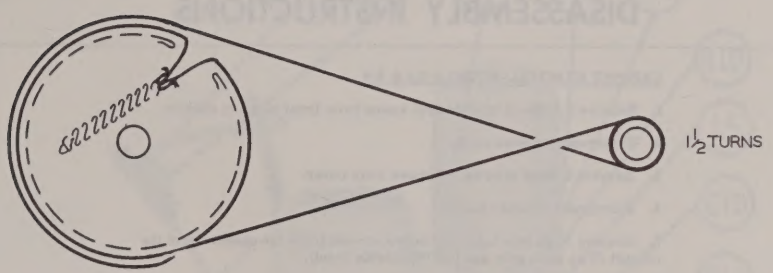
Check T6 and its associated components.

INTERMITTENT STREAKS

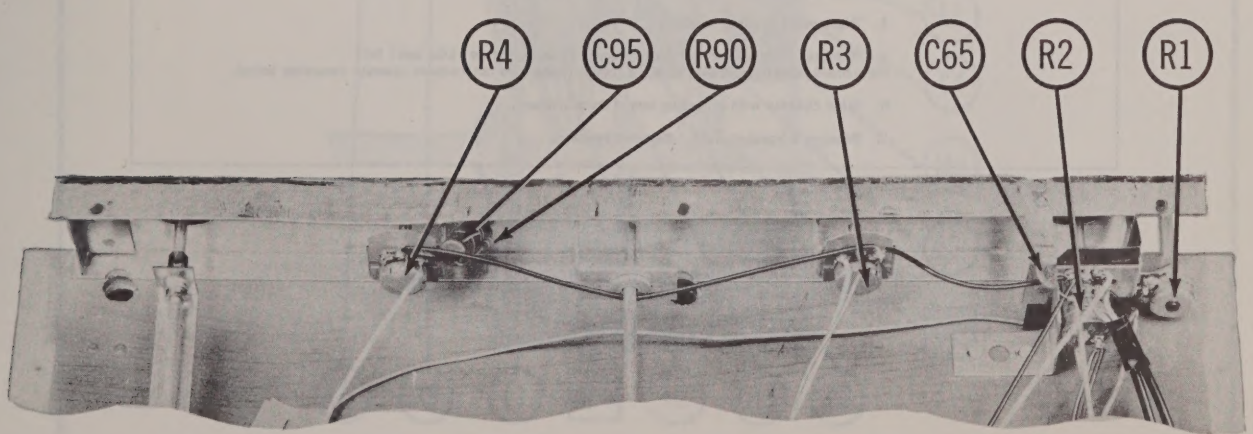
Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

UHF TUNING PULLEY IN MAX. COUNTER CLOCKWISE POSITION.



UHF DRIVE CORD STRINGING



CONTROL PANEL PARTIAL VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on Page 10.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug of (L60) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to set. Adjust the buzz control (R7) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL-MODELS 612 & 614

1. Remove 8 push-on type control knobs from front panel of cabinet.
2. Disconnect antenna leads.
3. Remove 8 wood screws. Remove rear cover.
4. Disconnect speaker leads.
5. Remove 5 chassis mounting board screws from the underside of the cabinet (2 on each side and 1 at the middle front).
6. Lift cabinet from chassis mounting board.
7. Remove 2 speaker nuts. Remove speaker.

CHASSIS REMOVAL-MODEL 622

1. Remove 8 push-on type control knobs from front panel of cabinet.
2. Disconnect antenna leads.
3. Remove 8 wood screws. Remove rear cover.
4. Disconnect speaker leads.
5. Remove 4 bolts securing chassis shelf to cabinet side rails and 1 bolt from block at the underside of shelf front. (Note: Do not remove chassis mounting bolts).
6. Slide chassis with mounting board from cabinet.
7. Remove 2 speaker nuts. Remove speaker.

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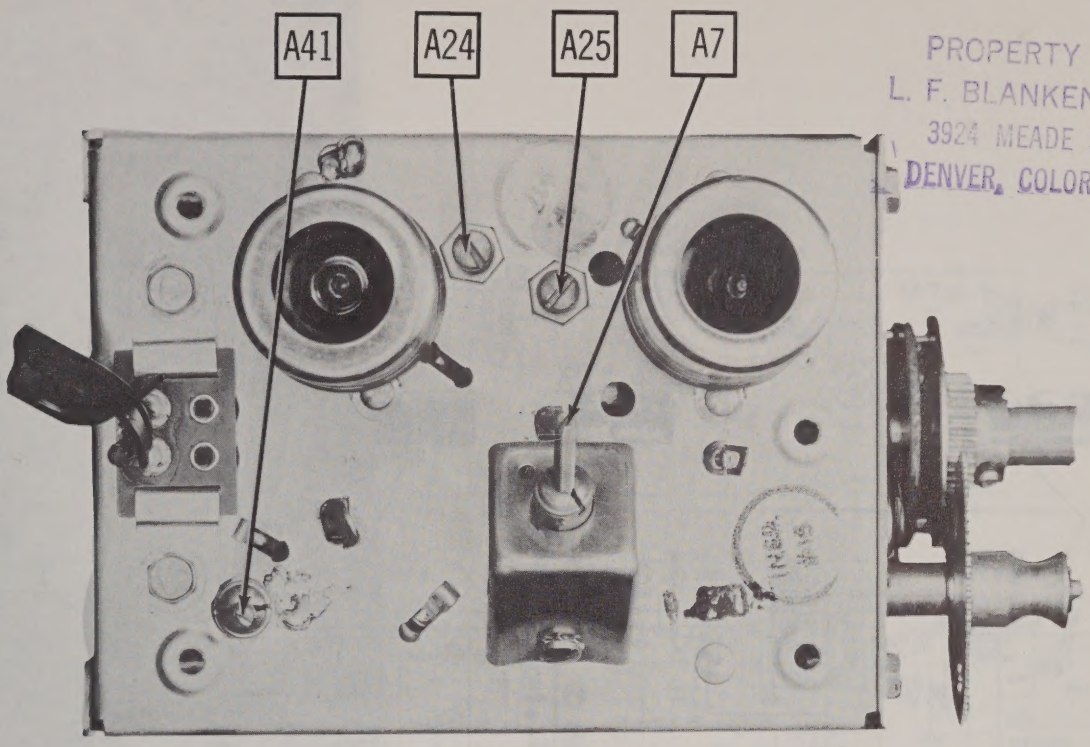
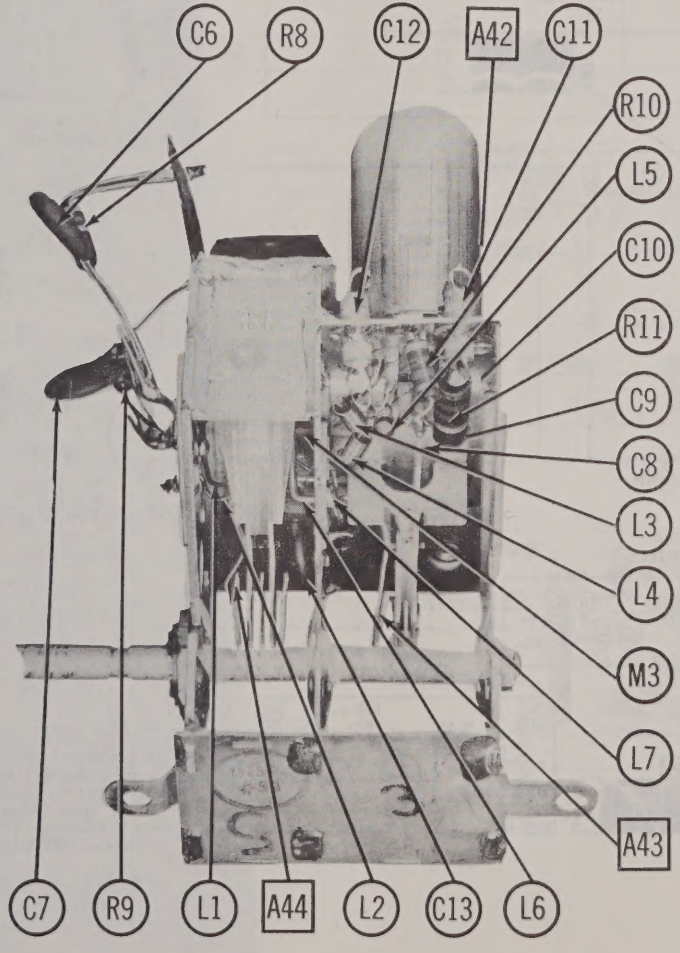
DENVER, COLORADO



VHF TUNER-TOP VIEW



UHF TUNER